THE IRON TRADE REVIEW

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THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

Though definite announcement of ore prices has not yet been made, the interchange of views between Cleveland sales agents for Lake Superior ores and various producing-consuming interests has given publicity this week to the proposed prices for 1903. As now expected these will be on a basis of $4.50, against $4.25 last year, for old-range Bessemers; $3.60 as against $3.25 last year for old-range non-Bessemers carrying 60 percent iron and 12 percent moisture; $4 as against $3.25 for the best Mesabi Bessemers, those of somewhat greater fineness physically bringing $3.85, and a third grade, still finer, $3.75; and $3.20 for Mesabi non-Bessemers. These prices are still subject to change. The estimated output for all ranges is 33,000,000 tons—16,000,000 tons for the steel corporation and 17,000,000 tons for other producers. Actual shipments are likely to fall 10 percent short of this, possibly more. The scarcity of melting stock for open-hearth furnaces which was a factor one week ago, is still pronounced, and some open-hearth plants in the Pittsburg district have been shut down for a portion of the week. The prospective inadequacy of the scrap supply to the demands of open-hearth plants is responsible for the decision of an important Pittsburg interest to build a number of Talbot furnaces, which will use a relatively small amount of old material. The pig iron market drifts along without incident. Further foreign purchases are made week by week, recent transactions being chiefly in German and Scotch irons. Foreign prices are slightly higher. The recent purchase of 38,000 tons of cast iron pipe for Philadelphia will probably involve the importation of considerable iron, as the pipe will be made at Eastern works. Southern producers of pig iron are not a unit as to prices for the second half. While $18.50 Birmingham for No. 2 is adhered to by some, as low as $18 is done; and second quarter iron is sold in some quarters on the same basis. Northern irons can be had in the middle West at prices below Southern quotations. While $21 for No. 2 foundry at furnace, delivery in the second half has been generally maintained by Eastern Ohio and Western Pennsylvania furnaces, sales are reported at Pittsburg at $20.75 for the second half, the freight being 85 cents. The railroad situation is not counted upon to remain hopeless through the year, and more furnaces will be ready to make iron in the next four months. Yet, as before, the amount of coke that can be delivered at consuming plants will determine the supply of pig iron. Demand for iron is not lessening perceptibly, even though the consuming trade is stepping up on to a new level of values; all depends on the ability of furnace companies to increase the supply. The ability of furnaces, in spite of coke troubles, to produce large percentages of higher grade irons is a factor in the situation affecting the price of mill and pipe foundry irons. Rolling mills find their raw material costs increasing and are more interested than ever in maintaining prices for bar iron. We note a sale of 5,000 tons of gray forge at $20.75 Pittsburg. Steel is strong and scarce. It is more and more difficult to get authentic reports of actual sales, but $29 to $29.50 Central Western mill and $30 Pittsburg represent closely the current market. A sale of 2,000 tons of foreign billets is reported at $30.50 Central Western mill. Finished material shows good activity in nearly every department and the conditions here are quite at variance with the quietness of the pig iron market. An advance of $2 a ton in wire products became effective Feb. 20, which restores prices to the early fall level. Bars have been considerably more active in the Central West and prices are better maintained. Sales of the week through Pittsburg, Cleveland and Chicago offices probably aggregate 60,000 tons. In the Chicago district an import sale of 1,000 tons of heavy rounds is reported at 1.85c. Some additional vessel business recently closed by lake yards led to the buying of 3,000 tons of shapes and 6,000 tons of plates in the week. Additional purchases of rails are reported by various roads whose requisitions for 1903 were thought to be complete in the large earlier contracts. The Gould roads have taken 10,000 tons more. Chicago rail business of the week amounted to 15,000 tons, heavy and light. The American Bridge Co. booked 20,000 tons of orders in the week for railroad, highway and architectural work.

PITTSBURG.

OFFICE OF *The Iron Trade Review*,
429 PARK BUILDING, Feb. 25.

The final announcement of the ore schedule for the coming season is expected by another week and the advance over last season's prices will range from 25 to 75 cents a ton. The base price for old range Bessemer will be $4.50, as compared with $4.25 last year, and the base price for old range non-Bessemer will be $3.60, as compared with a price approximating $3.25 last year. The best Mesabi Bessemers are expected to bring $4 per ton, as compared with $3.25 last year, while the base price of Mesabi non-Bessemer ores will probably be $3.20. Owing to the difference in the physical qualities of the Mesabi Bessemers these ores have been divided into three groups, the second group bringing 15 cents less a ton than the first, and the third 25 cents less than the first, thus making three prices, namely, $3.75, $3.85 and $4. It is further stated that practically every seller of ore in the Lake Superior regions will participate in the work of the ore association this year, differences which threatened trouble having been satisfactorily adjusted, as some of the larger interests contended that their ore was improperly classified. The United States Steel Corporation will not sell any ore in the open market this year and has made an announcement to this effect to the ore association, though last year it sold about 600,000 tons. Of course the contracts entered into by some of the constituent companies of the corporation before the latter's organization, and which have several years to run, will be filled as usual. Among them is one to supply the Jones & Laughlin Steel Co. with a large tonnage of Adams ore at $1.85 a ton, delivered at Lake Erie ports.

This advance in the price of ores of course means a higher cost for the production of pig iron, but at present prices for the latter the furnace operators will still have a handsome margin. Despite the fact that the stocks at lower lake ports and at the furnaces in the Valleys and in this district are unusually large the season's allotment is much larger than heretofore and no doubt the tonnage brought down will be much larger than during the last year.

Much interest is manifested in the foundry iron market by consumers in this district at the present time, owing to some of the low prices that have been named by a number of the Northern furnaces for deliveries running through the second half of the year. Consumers are receiving quotations as low as $20.50 per ton for No. 2 for second half delivery in comparatively small lots, and despite these alluring prices there has not been any considerable buying. We note one sale of 1,000 tons for second half delivery at $20.75, Pittsburg, while still larger tonnages have been closed as low as $20.50. It is doubtful if further concessions will be made by the furnacemen, as these quotations are fully a dollar per ton lower than they quoted two weeks ago. We also note the sale of 5,000 tons of forge iron for delivery the remainder of the first half at a price equivalent to $20.75, Pittsburg.

Another advance has been made in the price of wire products amounting to $2 per ton, which almost reestablishes the prices prevailing before the big reductions announced on October 1.

Large consumers of wire products and wire nails have not been caught by this advance, however, inasmuch as they practically covered all requirements for the next six months during the months of October, November and December.

The scarcity of heavy melting stock continues and a number of open-hearth furnaces in this district are shut down at the present time awaiting a supply of old material. No contracts have yet been placed for foreign basic, although the offerings are large. It is stated that the analysis of the iron offered differs so greatly from that used in local practice that it would be almost impossible to use it to advantage. In connection with this shortage in heavy melting stock it is interesting to note that the Jones & Laughlin Steel Co. intends to increase further its Talbot open-hearth operations by the erection of six or seven additional furnaces the size of the furnace recently completed and now in operation. No old material is required in this operation, and in view of the fact that with the great extensions to the ordinary open-hearth practice the price of old material would greatly increase—as is already the case—the extension of Talbot practice is deemed both economical and advisable. The erection of these additional furnaces will mean an increase in the company's steel production of nearly 2,000 tons per day.

PIG IRON.—Little basic or Bessemer iron has changed hands during the week, as both grades cannot be secured except in very small quantities for delivery the remainder of the first half of the year. The low prices that are being quoted by the furnaces operating on foundry iron will no doubt result in considerable buying for the second half of the year, although up to the present time the buying has been extremely limited. The forge iron market has been more active than for some time, sales of 5,000 tons for delivery during the remainder of the first half having been made at prices equivalent to $20.75, Pittsburg. Furnace operations in the Valleys continue to be hampered on account of the coke shortage, the furnaces operating on iron for the steel corporation receiving deliveries only once a week. We make the following quotations:

Bessemer, Valley	$21 50 to 22 00
Bessemer, Pittsburg	22 35 to 22 85
No. 1 Foundry	23 50 to 24 00
No. 2 Foundry	22 00 to 23 00
Gray Forge, Pittsburg	20 75 to 21 00
Chilled Basic, Valley	21 00 to 21 50
Chilled Basic, Pittsburg	21 85 to 22 35

STEEL.—Open-hearth billets for delivery the second half of the year are quoted at $31 per ton for ordinary analysis and there has been some buying at these prices. There have been no sales of Bessemer billets upon which to base a price, although quotations at $30 Pittsburg are being made and Valley mill quotations are $29 to $29.50. Bessemer rods are quoted at $36 per ton and open-hearth are held at $37.

FERRO-MANGANESE.—Domestic manganese, 80 percent, continues to be held at $50 per ton at the furnace, while English ferro is quoted at $52.50, delivered at buyer's mill in carload lots and over. Less than carload lots are held at $55.

SPELTER.—There has been practically no change in the market during the week and prime Western grades are held at 4.95c to 5c in large lots.

MUCK BAR.—Western mills are taking no orders for muck iron at present prices. Eastern mills are selling their product in this market at prices ranging from $33 to $33.25, while the Western mills are holding their product at $36 per ton. There has been no buying at the latter price and until the offerings of the Eastern mills fall off entirely the Western mills will be unable to dispose of their product.

SKELP.—The skelp market continues quiet and practically unchanged in prices. Steel skelp is held at 1.95c to 2c, while iron is held at 1.92½c to 1.95c.

RAILS AND TRACK MATERIAL.—The light rail market continues unchanged, although a slight advance has been made in some sections by an Eastern mill. There has been some little new business in the heavier sections, several railroads adding small amounts to their earlier requisitions. We quote as follows: Standard sections, 50 pounds and over, in lots of 200 tons and over, $28; car lots and less than 200 tons, $30; less than car lots, $32; light rails, 16 pounds and 20 pounds, $36; 25 to 40 pounds, $34 to $34.50. Track materials: Spikes, 2.15c to 2.25c; track bolts, square heads, 2.05c; hexagon heads, 2.65c; fish plates, 1.60c.

PLATES.—Plates for prompt delivery command premiums from $2 to $3 per ton, although for extended deliveries agreement quotations prevail. Considerable new business is being placed and the general situation continues strong. We make the following quotations: Tank plates, ¼-inch thick and up to 100 inches in width, 1.60c at mill, Pittsburg; flange and boiler steel, 1.75c; marine, ordinary, fire-box, A. B. M. A. specifications, 1.80c; still bottom steel, 1.80c; locomotive fire-box, not less than 2.10c, and it ranges in price to 3c. Plate more than 100 inches, 5c extra 100 pounds. Plate 3-16 of an inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra. These quotations are based on carload lots, with 5c extra a hundred pounds for less than carload lots. Terms, net cash, in 30 days.

BARS.—There has been considerable buying of small rounds by rivet manufacturers who have been covering requirements for the next six months. Other buyers have also bought freely during the week and the general steel bar situation is much stronger than a month ago. We quote: Bessemer steel bars, 1.60c; open-hearth, 1.70c; plow beams and cultivator beams, 1.60c, net; channels, angles, zees and tees, Bessemer under 3 inches, 1.70c; over 3 inches, 1.80c; bar iron, 1.80c, Youngstown, or 1.84¾c, Pittsburg, with freight added to point of delivery from Youngstown. Hoops and bands are quoted at 1.90c, full extras, in 250-ton lots and over, and 2c in less than 250-ton lots.

STRUCTURAL MATERIAL.—There have been no large contracts placed during the week, although a number are pending. Deliveries can now be made on nearly all kinds of shapes in about three months and premiums for prompt deliveries are no longer being paid. We quote: Beams and channels, 3 to 15 inches, 1.60c; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles from 3 to 16 inches, 1.60c; universal mill plates, 1.60c.

PIPES AND TUBES.—The amount of new business that is being placed continues very large and the mills of the National Tube Co. have their entire capacity sold up for several months. Prices on carload lots, plus the freight to destination, are as follows:

MERCHANT PIPE.

	Steel		Guaranteed Wrought Iron	
	Black Percent.	Galv. Percent.	Black Percent.	Galv. Percent.
⅛, ¼ and ⅜ inch	68	58	65	55
½ inch	70	60	67	57
¾ to 6 inch	75	65	72	62
7 to 12 inch	73	63	70	60
Plugged and Reamed				
1 to 4 inch	73	63	70	60
Cut 3 to 6 feet				
⅛, ¼ and ⅜ inch	63	52	60	49
½ inch	65	54	62	51
¾ to 6 inch	71	60	68	57
7 to 12 inch	69	57	66	54
Cut 6 feet and longer				
⅛, ¼ and ⅜ inch	64	53	61	50
½ inch	66	55	63	52
¾ to 6 inch	72	61	69	58
7 to 12 inch	70	58	66	55
Extra Strong Plain End				
⅛ to 8 inch	69	59	65	55

Threads only—Same as Plain End, plus 1¼ percent net.
Threads and Couplings—Same as Plain End, plus 2½ percent net.

Double Extra Strong Plain End				
¼ to 8 inch	61	51	57	47

Threads only—Same as Plain End, plus 2 percent net.
Threads and Couplings—Same as Plain End, plus 3 percent net.

NOTE: Orders for less than carload will be charged at 12½ percent advance. Extra and Double Extra Strong Cut Lengths, lower random discounts by 10 percent net for 6 feet and longer, and 15 percent net for 3 to 6 feet.

BOILER TUBES.

Steel.

	Percent
1 to 1½ inches	45
2¼ to 5 inches	62½
1¾ to 2¼ and 6 to 13 inches	52½

Iron.

	Percent.
1 to 1½ inches	56½
2¼ to 5 inches	45½
1¾ to 2¼ and 6 to 13 inches	55½

CASING.

	S. and S. Percent.
2 to 3 inches	58
3¼ to 4 inches	60
4½ to 12½ inches	62

SHEETS.—A better demand for both the lighter and heavier gauges of black sheets is reported and the independent mills which have been idle for months are again resuming in part. Concessions of from $1 to $2 per ton are still being granted, however. We make the following quotations: No. 28, 2.75c; No. 27, 2.65c; No. 26, 2.55c; Nos. 22 and 24, 2.45c; Nos. 18 and 20, 2.35c; Nos. 14 and 16, 2.25c; Nos. 10 and 12, 2.10c to 2.15c. Galvanized: No. 16, 2.60c; No. 18, 2.85c; No. 26, 3.35c; No. 27, 3.60c; No. 28, 3.85c; No. 29, 4.35c; No. 30, 4.50c.

WIRE AND WIRE NAILS.—Wire nails and all wire products have again been advanced, this advance being $2 per ton. Several weeks ago an advance of $1 per ton was announced and these advances practically restore prices prevailing six months ago. We revise quotations as follows: Wire nails, carload lots, to jobbers f. o. b. cars, Pittsburg, $2.00; plain wire, carload lots, $1.90; barb wire, carload lots, $2.30; staples, carload lots, $2.20. Galvanizing, 30 cents extra. Carload lots to retailers are held at 5 cents advance in all lines, and on less than carload lots a further advance of 10 cents is charged. Steel cut nails are quoted as follows: Carload lots, $2.10, and less than carload lots, $2.15 f. o .b. Pittsburg, plus freight to point of destination. Iron cut nails are $2.20 in carload lots and $2.25 in less than carload lots. Terms, 60 days, less 2 percent off in 10 days.

MERCHANT STEEL.—A better demand is reported for shafting and a number of large contracts have been closed for requirements for the next six months. We quote: Turned cold rolled and ground shafting, 47 off in carload lots and 42 percent off in less than carload lots; tire steel, 2.15c to 2.25c; spring steel, 2.25c to 2.35c; toe calk, 2.30c to 2.40c. The following differentials maintain: Less than 2,000 pounds of a size and not less than 1,000 pounds, 10 cents advance; less than 1,000 pounds of a size, 30 cents advance. Tool steel is quoted 7 cents and upwards, according to the grade.

OLD MATERIAL.—Heavy melting stock continues to be the center of interest and on contracts running through the next six months $20.50 per gross ton is asked, while for prompt delivery $21.50 to $22 is being secured. Our quotations, gross tons, are as follows: Heavy melting stock, $21.50 to $22; low phosphorus melting stock, $25 to $25.50; steel rails, $21 to $21.25; re-rolling rails, No. 1 cast scrap, $20.50 to $21; borings, $11 to $11.50; busheling scrap, $17.50 to $18.50; old iron rails, $24.50 to $25; turnings, $15 to $15.50.

COKE.—There has been no change in the general coke situation, high prices continuing to rule. Prompt foundry coke is held at $6.50 to $7 and furnace coke at $5 to $5.50. For the week ending Saturday, Feb. 14, the production of the upper Connellsville region is estimated at 242,896 tons, as compared with 240,670 tons the previous week. The production of the lower region amounted to 49,500 tons.

A. M. Crane & Co., Inc., Chicago, importers and dealers in foreign and domestic metal products, will open a Pittsburg office March 1, at 530 Frick Building, which will be in charge of A. M. Crane, president of the company.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
519 MONADNOCK BLOCK, Feb. 24.

The American Steel & Wire Co. has advanced the cost of all wire products $2 a ton, the new price going into effect Feb. 20. The difficulty in getting coal and coke, the increased cost of these materials, and the scarcity of billets and rods are the reasons assigned for this increase. The company's wire mills at Waukegan and Joliet have been in a precarious condition for two or three weeks, owing to the shortage of billets caused by the banking of several of the Illinois Steel Co.'s furnaces at different times for lack of coke and the enforced idleness of the rod mill at Joliet for want of coal and billets. While all the furnaces and mills are now in full operation, the difficulties attending the supply of raw material are so great, and so little dependence can be placed on railroad promises of betterment, that neither company can tell how soon the supply may again be shut off. There has been a heavy demand for wire products of all kinds, and much inconvenience has been caused the trade by delays in shipments due to the scarcity of rolling stock and the frequent traffic blockades.

An important transaction of the week is the order received by the United States Cast Iron Pipe & Foundry Co. from a Philadelphia contractor for 38,000 tons of pipe, of which 27,000 tons will be 60-inch and 11,000 tons, 48-inch. This is probably the largest single order ever placed for cast iron pipe, and officials of the company state it will be filled at one of the tidewater plants. Though foreign iron, it is said, will be used to a large extent on this contract, there is speculation as to the effect the order will have on the Southern pig iron market. That it will strengthen it is the opinion of sellers, who look for increased demand and firm prices.

In finished iron and steel no change is to be noted. Orders for about 15,000 tons of heavy and light rails have been placed during the week, and for several thousand tons of structural steel; while the demand for track supplies, plates, bars, merchant pipe, etc., is without diminution. Sales are reported of 2,000 tons of imported Bessemer billets at $30.50 Chicago; of 1,000 tons of foreign heavy steel rounds at 1.85c Chicago, (in addition to the 3,000 ton order of the week previous), and of 400 tons of domestic forging billets at $36 to $38 a ton. The demand for pig iron continues to be a desultory character, and is limited almost entirely to small lots for quick shipment. The scrap market is without animation, though prices are steady.

PIG IRON.—There is no appreciable change from the conditions that have ruled since the first of the year. A fairly good business has been transacted, though confined almost exclusively to lots below 500 tons, all for prompt delivery. One sale of 900 tons of malleable Bessemer, for shipment in the last half, has been made during the week at $23 Chicago, which is conspicuous by its isolation. Several inquiries for this delivery were received, but no sales resulted, as they were sent out merely to sound the market. Though the leading Southern producers are a unit in holding prices firm on the basis of $18.50 for No. 2 foundry for delivery in the months prior to July 1, instances are frequent of smaller producers shading this price. We note the sale in the past week by one of these furnaces of 700 tons of No. 2 soft for shipment in March, April and May at $18.25 Birmingham; of 400 tons of No. 3 foundry at $17.75 furnace, and of 300 tons of No. 2 foundry, for immediate shipment, at $18.25 furnace. The demand for spot iron, by which is now meant iron on track, while in the aggregate not very large, is amply sufficient to take up from week to week the unsold furnace capacity; and if the fuel scarcity could be abated to any extent, the call would undoubtedly be so much larger that there would inevitably be higher prices for delivery from March to July inclusive. The price for this material varies, but is generally held at 50 cents per ton above that asked for more extended deliveries. There is a fairly good demand for silvery iron of 4 percent to 5 percent silicon, which is offered at $24.75 Chicago. Considerable standard Bessemer has been sold, and several sales of charcoal iron are reported. The railroad embargo continues to militate against any improvement either in the buying or delivery of iron, and no betterment is noted in this situation during the week. We quote as follows:

Lake Superior Charcoal	$26 50 to 27 50
Local Coke Foundry No. 1	23 50 to 24 50
Local Coke Foundry No. 2	23 00 to 24 00
Local Coke Foundry No. 3	22 50 to 23 50
Local Scotch Foundry No. 1	24 00 to 24 50
Southern Coke No. 1	22 85 to 23 35
Southern Coke No. 2	22 35 to 22 85
Southern Coke No. 3	21 85 to 22 35
Southern Coke No. 4	21 35 to 21 85
Southern No. 1, soft	22 85 to 23 35
Southern No. 2 soft	22 35 to 22 85
Southern Gray Forge	21 35 to 21 85
Southern Silveries (according to silicon)	26 15 to 27 15
Jackson Co. Silveries, 6 to 8 percent silicon	21 30 to 22 30
Ohio Strong Softeners	26 30 to 26 80
Alabama and Georgia Car Wheel	27 35 to 28 35
Malleable Bessemer	23 00 to 24 00
Standard Bessemer	23 30 to 24 30

BARS.—There is a good demand for both iron and steel bars, and specifications aggregate a tonnage of no mean proportions. All the mills are full of orders and the outlook is more encouraging. We note the sale of an additional 1,000 tons of heavy steel rounds of foreign manufacture at 1.85c Chicago. The price of iron bars is stiffening, one local mill having advanced its quotation to 1.90c Chicago. We quote as follows; mill shipments, Chicago delivery: Bessemer steel, 1.76½c; hard steel angles, less than 3x3, 1.86½c base; soft angles, 4x4 and less, 2.10c; hoops in lots of 250 tons and greater, 2.06½c; less than this amount, 2.16½c; iron, 1.81½c to 1.86½c. Store prices are as follows: Steel, 2c to 2.10c; iron, 2.15c to 2.20c; hoops, 2.40c to 2.50c; angles, 2.25c to 2.50c rates.

SHEETS.—The market has shown a healthier tone in the week than for some time, the demand for both black and galvanized sheets having greatly increased. Some independent mills are reported to be getting higher prices, but no change from the following quotations has been announced; No. 27 black, 2.76½c to 2.86½c; No. 28, 2.86½c to 2.91½c; galvanized, No. 27 gauge, 3.35c to 3.45c. For deliveries from stock, No. 27 black, 3c, and galvanized 75 and 5 percent.

STRUCTURAL MATERIAL.—The principal contract for the week is that placed for the structural shapes required in the Railway Exchange Building, amounting to about 4,000 tons. Several smaller orders have been booked, while the specifications have been numerous and large in total tonnage. A good demand is reported from stock. We quote mill prices, Chicago delivery Beams, 15 inches and under, 1.75c to 2c; 18 inches and over, 1.85c to 2.10c; universal plates, 1.75c to 2c; angles, channels and tees, 1.85c to 2c base. The maximum quotation is asked by some mills on lots for quick delivery. On lots from store, cut to length, we quote 2¼c to 2½c per pound.

PLATES.—There is no diminution in the demand, and the local producer has had to refuse considerable business. We quote mill shipments, Chicago delivery, as follows: Tank steel, ¼-inch and heavier, 1.75c to 1.95c base; flange steel, 1.85c to 2c base. Prices from stock, tank steel, ¼-inch and heavier, 2.25c to 2.35c; 3-16, 2.25c to 2.40c; Nos. 8 and 10, 2.40c to 2.50c; flange steel, 2.50c to 2.60c.

RAILS AND TRACK SUPPLIES.—Orders have been booked during the week for 15,000 tons of heavy and light rails, among which was 10,000 tons of heavy sections for immediate delivery for the Lake Shore. The demand for track supplies is good. We quote heavy rails, $28; second quality, $27; light rails, 45 pounds, $34 to $35; 12 pounds, $40 to $41, with regular differentials for intermediate sizes. Track supplies, mill shipments, are quoted as follows: Angle bars, 2c to 2.10c; spikes, first quality, 2.25c (out of store, 2.40c to 2.50c rates); second quality, 2.15c; track bolts, 3½x¾, with square nuts, 2.85c to 3c per 100 pounds; with hexagon nuts, 3.05c to 3.15c, with usual differentials for other sizes.

MERCHANT STEEL.—Specifications have been received in good sized volume, consumers in all cases taking the full quotas named in their contracts. New business is of fair proportions, but is limited in quantity owing to the crowded condition of mills. We quote mill shipments, Chicago delivery, as follows: Spring steel, 2.65c to 2.75c; sleigh shoe, 1.95c flat sizes; concave and convex, 2c; out of store, 2.15c; cutter shoe, 2.50c to 2.60c; machinery steel, 2.15c to 2.25c base; plow steel, 2.50c and upwards, according to quality; toe calk, 2.30c to 2.40c; out of stock, 3c to 3.10c; ordinary tool steel, 6c to 7c; specials, 13c and upwards; less than carload lots 5 to 10 percent higher; cold rolled shafting, carload lots, 47 percent off; less than carload lots, 42 percent off.

MERCHANT PIPE.—Producers report that jobbers have been placing contracts freely during the week. Mills still complain of delayed shipments caused by the shortage of rolling stock and the freight blockades. We quote prices to consumers, mill shipments, carload lots, random lengths, f. o. b. Chicago, as follows:

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent.	Guaranteed Wrought Iron Pipe. Black. Percent.	Guaranteed Wrought Iron Pipe. Galv. Percent.
⅛ to ¾ in inclusive	66.35	56.35	63.35	53.35
½ inch	68.35	58.35	65.35	55.35
¾ to 6 inches, inclusive	73.35	63.35	70.35	60.35
7 to 12 inches, inclusive	71.35	61.35	68.35	58.35

Less than carload lots, 12½ percent advance over above prices.

BOILER TUBES.—There is a good demand both from mill and stock, and prices are firm. We give below quotations for carload lots, mill shipments, f. o. b. Chicago. Less than carload lots from mill, 12½ percent is to be added.

	L. W. Steel Percent.	C. C. Iron Percent.
1 to 1½ in	43.35	38.35
1¾ to 2½ in	55.85	35.85
2¾ to 5 in	60.85	45.85
6 to 13 in	55.85	35.85

For lots direct from warehouse stock:

	L. W. Steel Percent.	C. C. Iron Percent.
1 to 1½ in	35	35
1¾ to 2½ in	47½	32½
2¾ to 5 in	55	42½
6 to 13 in	47½	32½

CAST IRON PIPE.—What is probably the largest single contract ever placed for cast iron pipe, was given the leading producer of this material last week. The order amounted to 38,000 tons, divided into 27,000 tons of 60-inch pipe, and 11,000 tons of 48-inch. The consideration is said to be $1,600,000. The pipe is for the city of Philadelphia and was ordered by a contractor of that city. Deliveries are to begin immediately and will extend over a year. Officials of the company state that this material will be manufactured at one of its tidewater plants. We quote f. o. b. Chicago, 4-inch water pipe, $34; 6-inch, $33; 8-inch and upwards, $32; gas pipe $1 a ton higher.

BILLETS AND WIRE RODS.—We note the sale of 2,000 tons of imported Bessemer billets to a Western concern for shipment in March and April at $30.50 Chicago, and of 400 tons of domestic forging billets. Domestic Bessemer billets and rods are scarce and no sales are reported. We quote wire rods, $37.50 Chicago; Bessemer billets, $31.50; small lots from stock, 4x4, $40; open-hearth billets for forging purposes, $36 to $38; for use in rolling mills, $32.50 to $33. German basic Bessemer billets, Chicago delivery, $30.50 to $31. Special carbons higher.

WIRE NAILS AND FENCING.—The leading producer announces an advance of $2 per ton on all wire products, effective Feb. 20. There has been a good demand during the week, though shipments have been seriously delayed owing to the scarcity of rods and billets; the congestion of freight on all railroads, and the difficulty of getting coal and coke with which to operate plants. We quote prices to jobbers, Chicago delivery, as follows: Plain wire, carloads, $2.10; smaller lots, $2.20; galvanized $2.40 in carloads and $2.50 smaller lots. Barb wire is $2.50 in carloads, and $2.60 in less than carload lots; galvanized, $2.80 in carloads, and $2.90 in lesser lots. Staples are $2.80 in carloads, and $2.90 in lesser lots. Staples are carloads, and $2.30 smaller quantities; cut nails, $2.26½ carloads, and $2.36½ less than carloads. Poultry netting to jobbers, 75 and 5 percent discount from list f. o. b. Joliet or DeKalb, with actual freight allowed not exceeding 50 cents per 100 pounds.

COKE.—The inadequacy of railroad facilities is still keeping down the supply of coke to consumers in this city and contiguous territory. There has been a moderate demand during the week, and Southern coke is offered at $9.50 to $10, and Connellsville, $10 to $10.50.

OLD MATERIAL.—There is no disposition on the part of mills to buy at present prices, and neither is there any disposition among sellers to sell below them. Scrap is not coming into this city at the usual rate owing to the refusal of many railroads to handle it, and the decrease in country shipments is responsible for the present firm market. We quote gross tons as follows:

Old iron rails	$23 50 to 24 00
Old steel rails (mixed lengths)	18 00 to 18 50
Old steel rails (long lengths)	22 00 to 22 50
Relaying rails	31 50 to 32 00
Old wheels	23 00 to 23 50
Heavy melting steel	17 00 to 17 50
Mixed country steel	15 00 to 15 50

The following are selling prices per net ton:

No. 1 R. R. wrought	$19 50 to 20 00
No. 2 R. R. wrought	18 00 to 18 50
Shafting	19 00 to 19 50
Dealers' forge No. 1	16 50 to 17 00
No. 1 busheling and wrought pipe	14 00 to 14 50
No. 1 cast	16 50 to 17 00
Railway malleable	15 50 to 16 00
Country malleable	14 50 to 15 00
Iron axles	23 50 to 24 00
Steel axles	19 50 to 20 00
Cast borings	10 00 to 10 50
Mixed borings, etc	9 50 to 10 00
Wrought turnings	13 50 to 14 00
Machine shop turnings	13 00 to 13 50
Iron axle turnings	14 00 to 14 50
Steel axle turnings	13 50 to 14 00
Stove plate and light cast scrap	12 50 to 13 00
Old iron splice bars	21 00 to 21 50

CLEVELAND.

OFFICE OF *The Iron Trade Review*,
1064 ROSE BUILDING, Feb. 25.

During the past week, the making of tests of Mesabi ores to

determine values on physical basis, has been continued and it is expected that the final reports of these tests will be made this week. Until this has been done, the schedule of ore prices for 1903 will not be unalterably determined, but the figures which have been discussed with furnace interests are very nearly those which will prevail; that is, old range Bessemer, $4.50; Mesabi Bessemer, $4; Mesabi non-Bessemer, $3.25; old range non-Bessemer, $3.60. Last year the base price of old range Bessemer was $4.25, while the best Mesabi Bessemer brought $3.25. There was no agreement on the latter, nor on old-range non-Bessemers, which were sold on a basis of $3.25 for an ore 60 percent in iron and 12 percent in moisture. For the best Mesabi non-Bessemer $2.75 was asked. It will be noted that the proposed differential between old and new range Bessemer this year is 50 cents instead of $1, last year. The Bessemer prices are based on a supposititious ore assaying 63 percent metallic iron, .045 percent phosphorus and 10 percent moisture. The estimated production of Lake Superior mines for 1903 is 16,000,000 tons for the United States Steel Corporation, and 17,000,000 tons for other companies, though the probabilities are that actual shipments will be about 10 percent less. Ore is now moving very slowly from the docks, orders from furnaces being small, and it is estimated that there will be about 4,000,000 tons on docks May 1.

COKE.—The movement of coke last week was very light and the supply of cars this week is not much more satisfactory. Foundries have very little coke on hand and some of them have been compelled to stop. Spot, when obtainable, is sold at $7 to $7.50, while $5.75 continues to be the price for Connellsville foundry at the ovens.

PIG IRON.—The activity which appeared about ten days ago is not now evident and the hesitation which continued for so long on the part of both buyers and sellers is again pronounced so far as the second half is concerned. The agent for a Valley furnace has, within a few days, turned down inquiries for several thousand tons of foundry No. 2 for the last half, the company not being willing to sell at $21 at furnace, the price at which some sales have been made. However, $20.50 has been quoted by some and as low as $20 at furnace. For Southern Ohio iron for the last half $22 at the furnace is asked. For the first half, the Valley price is about $22, or $22.85, Cleveland, but there is very little in the market. We quote as follows, f. o. b. Cleveland, for shipments in the first half of 1903:

Bessemer	$21 85 to 22 35
No. 1 Strong Foundry	23 00 to 23 50
No. 2 Strong Foundry	22 50 to 23 00
No. 3 Foundry	21 75 to 22 25
Scotch No. 1	23 00 to 23 50
Scotch No. 2	22 50 to 23 00
Gray Forge, Valley	20 00 to 20 25
Lake Superior charcoal	26 50 to 27 50

FINISHED MATERIAL.—The market is stronger in nearly all kinds of finished material and few complaints, except about the railroads, are heard. Jobbers particularly are in a confident frame of mind. The tendency on the part of manufacturers to sell direct to consumers is not so marked as it has been recently and under prevailing conditions jobbers feel that they will be able to do a business of fair volume at prices which will insure reasonable profit. The week has been an active one in bars, the tonnages reported both by manufacturers and jobbers being much larger than in recent weeks. About one-third of the tonnage taken was iron. Present indications are that the price of 1.80c, Youngstown, for iron, recently agreed to by the principal producers, will be maintained. There have, however, been two disturbing factors. The Western mills continue to quote from $2 to $3 per ton below the principal producers, but their product, being limited in both volume and variety of sizes, is not expected to offer formidable competition. The other subject which has been much discussed is the position of buyers who are located near the mills which have been cutting prices. This has caused some dissatisfaction among buyers in the Cleveland district and it is stated that the territory covered by the agreement to sell at 1.80c, Youngstown, will be so extended as to meet this complaint. For steel bars, the price is still 1.70c for open hearth and 1.60c for Bessemer, Pittsburg, but for the latter jobbers are getting 1.65c for mill tonnages of less than a car load. Shipbuilding interests have placed orders for 3,000 tons of shapes and 6,000 tons of plates, the material to be used for three car ferries and one steel freighter. Inquiries for structural material are coming in at a rate which indicates that the business of the summer will be very large and that it will be just as difficult next summer as it was last to get prompt delivery. Specifications, as usual at this time of the year, are coming in very slowly for structural material, but it is being suggested that builders will be wise in filing specifications before the busy season. Agreement quotations on structural material are as follows: Beams and channels, 3 to 15 inches, 1.70c; 18 to 24 inches, 1.80c; tees, 1.75c; zees, 1.70c; angles from 3 to 6 inches, 1.70c; universal mill plates, 1.70c. Agricultural interests have not yet appeared in the market, but are expected to do so at an early date. The sheet situation, which has so long been unsatisfactory, shows distinct signs of improvement, the demand being stronger, while cutting below the prices of the principal producers is seldom heard of. The prices of the principal producers, through jobbers, are as follows: For 3-16-inch sheets and heavier, 2.15c, Cleveland. Mill sales of black sheets, Cleveland, to consumers: No. 24, 2.65c to 2.75c; No. 26, 2.75c to 2.85c; No. 27, 2.85c to 2.95c; and the following prices out of stock: No. 10, 2.35c to 2.50c; No. 12, 2.45c to 2.60c; No. 14, 2.50c to 2.60c; No. 16, 2.55c to 2.70c; Nos. 18-20, 2.75c to 2.90c; Nos. 22-24, 2.85c to 3c; Nos. 25-26, 2.95c to 3.10c; No. 27, 3.05c to 3.20c; No. 28, 3.15c to 3.30c. On galvanized sheets we quote mill sales in carload lots, Cleveland, as follows: Nos. 10 and 11, 2.60c; Nos. 12-14, 2.70c to 2.85c; Nos. 18-21, 3c to 3.15c; Nos. 22-24, 3.30c to 3.45c; Nos. 25-26, 3.55c to 3.70c; No. 27, 3.80c to 3.95c; No. 28, 4.05c to 4.20c; No. 29, 4.45c to 4.60c; No. 30, 4.95c to 5.10c. Galvanized sheets out of stock are quoted at 75 and 2½ off.

OLD MATERIAL.—Old rails are scarce and have advanced $1. Malleable iron is stronger. The demand in general is good and mills are making purchases of fair volume. We quote Cleveland delivery, all gross tons, as follows:

Old iron rails	$25 00 to 26 00
Old steel rails (over 6 feet)	22 00 to 23 00
Old steel rails (6 feet and under)	20 00 to 20 50
Old car wheels	22 50 to 23 00
No. 1 R. R. wrought scrap	21 00 to 21 50
Mill scrap	19 00 to 19 50
No. 1 machine cast scrap	21 00 to 21 50
Iron axles	29 00 to 30 00
Steel axles	28 00 to 29 00
Axle turnings	18 00 to 19 00
Wrought turnings (free from cast)	16 00 to 17 00
Cast borings	11 00 to 11 50
Uncut wrought iron boilers	19 00 to 18 00
Steel boiler plates	17 00 to 18 00
Grate bars	13 00 to 14 00
Pipes and flues (clean)	17 50 to 18 50
Tank iron	17 00 to 18 00
Hoop and band iron	13 50 to 14 50
Sheet iron	12 00 to 13 00
Wrought drillings	15 50 to 16 50
Malleable iron (railroad)	20 00 to 20 50
Malleable iron (agricultural)	17 50 to 18 00
Stove plate	16 00 to 17 00
Heavy steel	19 00 to 20 00

CINCINNATI.

Feb. 24.

The past week shows no change in the situation. The movement of coke is perhaps more retarded by lack of transportation facilities, and as a result quick deliveries of coke command a premium. The latest from the Pocahontas district is that a number of the operators have been obliged to blow out ovens for lack of cars to ship their product. We quote spot foundry coke at $8.50 to $9 per ton f. o. b. Cincinnati. There is still great difficulty experienced in getting pig iron forward on contracts.

PIG IRON.—The week under review has been exceedingly quiet. Buyers maintain their waiting attitude, and the few sales being made are for prompt shipment iron. So far as current business is concerned, $18.50 Birmingham for No. 2 foundry practically represents the market. There are still scattering transactions at $18 to $18.25 Birmingham for No. 2 foundry, but sellers are not pushing sales at these prices and they are only made to meet competition on Northern irons or some like extremity. In low grade irons we hear of no transactions, and $16.50 Birmingham represents the inside price at which gray forge can be had, some furnaces asking $17 and others $17.50. There is still considerable irregularity in prices. We quote three sales of No. 3 foundry as examples, all for quick shipment: 100 tons, $18.25 Birmingham; 50 tons, $17.10 Birmingham; 400 tons, $16.75 Birmingham; while the general market is regarded as

$17.50 Birmingham. A buyer for one of the largest melters in the country was in the city last week picking up all the bargains to be had. He is said to have purchased between 3,000 and 4,000 tons of various grades. The present rates of freight on Southern iron made it difficult to compete with Ohio furnaces in Northern and Eastern Ohio territory, and even into Southern Michigan. The bulk of the business in this territory is going to Northern furnaces. Instead of attempting to meet this competition by reducing prices Southern furnaces show a disposition to wait until the Northren furnaces are sold up. Southern Ohio furnaces are generally asking $1 per ton more for No. 2 foundry than the Valley furnaces. We make no change from prices quoted last week for quick delivery and first quarter of 1903, f. o. b. Cincinnati:

Southern Foundry No. 1	$22 50 to $23 00
Southern Foundry No. 2	21 75 to 22 25
Southern Foundry No. 3	20 75 to 21 25
Southern Foundry No. 4	19 75 to 20 75
Southern Foundry No. 1, soft	22 50 to 23 50
Southern Foundry No. 2, soft	21 75 to 22 25
Gray Forge	19 75 to 20 75
Northern Foundry No. 1	22 00 to 23 00
Northern Foundry No. 2	21 00 to 22 00
Southern car wheel iron	28 25 to 28 75

It has been stated in some trade reports and talked about among pig iron men, that there were 100,000 tons of pig iron at Latonia, Ky., on the L. & N. R. R. piled on the ground waiting cars. Inquiry of the L. & N. R. R. officials develops the fact that the amount actually on the ground there is 2,500 tons, which is about 100 cars.

Finished Material.—The demand for the lighter makes continues fairly active with no quotable change in prices. Aside from a few bargain lots in bars a steady tone prevails. Prices for bar iron in carload lots are: 1.90c base, half extras f. o. b. Cincinnati; steel bars, 1.73c base, half extras f. o. b. Cincinnati. Both are retailed at 2.20c base, full extras out of store. Sheets are in fairly active demand and steady. We quote black sheets No. 27 at 2.78c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 3.10c; No. 27, 3.00c; No. 16, 2.70c; No. 14, 2.60c; No. 12, 2.50c; No. 10, 2.40c. Galvanized sheets in car lots sell at 75 and 10 percent off; less than car lots, 70 and 10 percent off. Tank plates are firm and sell out of store at 2.25c for ¼-inch and 2.35c for 3-16-inch. There is still a fair demand in a retail way for structural shapes and prices are well mantained. Beams and channels are quoted at 2¼c to 2¾c from stock, and angles at 2.15c to 2.25c for base sizes.

In merchant pipe the demand is active. Prices are hardening. Independent mills are now so well sold up on the smaller sizes of iron pipe, from 2 inches down, that they are asking higher prices than the schedule. On the larger sizes there is still a tendency to quote under the leading interest, but they are experiencing difficulty in making prompt deliveries, and the leading interest, having supplies readily available, is confident of being able to obtain a good share of the business as soon as spring trade with its urgent demand begins, under the belief that prompt delivery will be commanding a premium. Merchant pipe and boiler tubes are quoted as follows for carload lots f. o. b. Cincinnati:

MERCHANT PIPE.
(Basing discounts.)

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent.	Guaranteed Wrought Iron Pipe. Black. Percent.	Guaranteed Wrought Iron Pipe. Galv. Percent.
⅛, ¼, ⅜-inch	66.8	56.8	63.8	53.8
½-inch	68.8	58.8	65.8	55.8
¾ to 6-inch, inclusive	73.8	63.8	70.8	60.8
7 to 12-inch, inclusive	71.8	61.8	68.8	58.8

BOILER TUBES.

	Steel Percent.	Iron Percent.
1 to 1½ in.	43.8 & 5	38.8 & 5
1¾ to 2½ in.	56.3 & 5	36.3 & 5
2¾ to 5 in.	61.3 & 5	46.3 & 5
6 to 13 in.	56.3 & 5	36.3 & 5

Old Material.—The market remains steady and fairly active, with no quotable change in prices. We quote:

Old No. 1 wrought railroad, net tons	$18 50 to 19 00
Cast machine and foundry, net tons	17 00 to 17 50
Old iron rails, gross tons	22 50 to 23 00
Old steel rails, gross tons	21 50 to 22 00
Old short lengths, gross tons	17 50 to 18 00
Old iron axles, net tons	27 00 to 27 50
Old chilled car wheels, gross tons	22 00 to 22 50
Stove plate, net tons	11 50 to 12 00
Wrought turnings, net tons	15 00 to 15 50
Cast borings, net tons	12 00 to 12 50

PHILADELPHIA.

Feb. 24

There is considerable activity on the part of buyers and confidence that there will be no weakening of prices is stronger than it was a few weeks ago. The storm of last week resulted in almost a complete cessation of coke shipments. Many furnaces and foundries are on the verge of being compelled to stop on account of the inadequate fuel supply. It is reported that contracts for furnace coke are being made up to Oct. 1 at present prices.

Pig Iron.—The price of basic iron has advanced 50 cents, with sales of large volume during the past week. Other kinds of pig iron are in fair demand with no change of prices. Markets in Europe are higher. Deliveries are easier and indications have favored better supplies, but it is doubtful whether this condition will long continue. Prices are about as follows: No. 1 X Foundry, $23.50 to $24; No. 2 X Foundry, $22.25 to $22.75; No. 2 Plain, $21 50 to $22; gray forge, $19.50 to $20.50; Middlesboro No. 3, $21 to $21.50; Scotch, $22.50 to $23.50; basic, $19.75 to $20.50.

Billets.—There is an increasing scarcity of steel and the tendency of prices is upward. German steel sells at $28 and Canadian about $30, while American basic open-hearth brings from $32 to $32.50.

Finished Material.—There is good demand, not exceptional for this time of the year, however. It is expected that requirements will be much larger than indicated by current orders. We quote as follows: Plates, small lots, 2.10c to 2.15c; carload lots, ¼-inch and thicker, 2c to 2.05c; universals, 2c to 2.05c; flange, 2.10c to 2.20c; firebox, 2.25c to 2.30c; marine, 2.30c to 2.35c. Steel bars, 1.80c to 1.90c; prompt shipments from local mills; Western steel, 1.75c to 1.80c; bar iron, 1.93½c to 1.98½c, for carload lots as minimum quantity. Structural material in small sizes, 1.73½c to 1.80c; large sizes 1.90c to 2.10c.

Old Material.—Prices are firm and show little change. We quote as follows: Old steel rails, $20.75 to $21.25; miscellaneous heavy steel scrap, $20.25 to $20.75; low phosphorus scrap, $26.50 to $27.50; old steel axles, $25 to $26; old iron axles, $29 to $30; old iron rails, $23.50 to $24; old car wheels, $22.50 to $23.50; choice scrap, R. R. No. 1 wrought, $23 to $24; country scrap, $20 to $21; machinery cast, $19.50 to $20.50; No. 2 light scrap (forge), $17.50 to $18; No. 2 light scrap (ordinary), $13.50 to $14.50; wrought turnings, $16 to $16.50; wrought turnings, choice heavy, $16.75 to $17.50; cast borings, $10.50 to 11; stove plate, $15 to $16.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1909, NO. 150 NASSAU ST., Feb. 24.

Pig Iron.—The pig iron market in this vicinity during the past week was extremely quiet, in consequence of the severe weather which has marked the present winter, and of practically two holidays intervening. Several agents are unable to report a single sale. Inquiries, however, made their appearance in goodly numbers, and represented a heavy tonnage. Evidence is accumulating daily that any activity that may develop in pig iron in this market during the next few months, will embrace foreign irons alone. Those who have entertained the hope that domestic brands would be cheaper are concluding that they must either purchase from home furnaces at current quotations or get their entire supply from abroad. Many inquiries for foreign irons are from melters who have not used them heretofore. German iron in particular is being inquired for to a larger extent. These brands, as a result, have stiffened a little in price, and command about $20.50, New York, delivery, duty paid, where the desired analysis is obtained. Middlesboro No. 3 remains firm and sales of cargo lots are a shade lower than $18, for this delivery with duty paid. The domestic situation is unchanged. Foundry operations were greatly curtailed recently on account of the elements, and the question of fuel still continues to affect them. Orders for castings are reported to be extremely good. We quote: No. 1 X Northern, $23.25 to $24.25; No. 2 X, $22 to $22.75; No. 2 plain, $21 to $21.75; Southern No. 1 foundry, $23 to $23.50; No. 2

foundry, $20 to $22.50; No. 3 foundry, $21.50 to $22; No. 4 foundry, $20.50 to $21.

BILLETS.—Nothing of particular interest to note. Some excellent business is said to be in sight, but delays in the closing of contracts are frequently met with. German basic Bessemer and open-hearth billets are quoted at $28 and $29, on large lots, New York delivery, duty paid.

FINISHED IRON AND STEEL.—Business in all lines of the finished material market has a firm undertone. In structural material, small orders, but representing some good tonnage, form current trade. During the week the American Bridge Co. booked small orders for railroad work in various parts of the East, aggregating 6,500 tons; also for 10,000 tons for building purposes in the Middle West, and for 3,500 tons for highway work. Several orders of good size are in excellent shape for closing in the near future. In plates business at considerable increase over mill prices is easily obtainable, while orders for extended delivery are daily increasing in volume. Sheets are fairly strong, but transactions do not show much life, and statements that the season is backward in this respect are heard. The bar situation is quiet, and ex-store concessions especially are met with. New York prices are as follows: Beams and channels, 15 inches and under, 1.75c to 1.90c; angles, 3 to 6 inches, 1.75c to 1.90c; zees, 1.75c to 1.90c; bulb angles, 2.05c to 2.35c; deck beams, 2.05c to 2.25c; sheared steel plates, tank, 2.10c to 2.15c; flange, 2.25c to 2.30c; fire box, 2.30c to 2.50c; refined iron bars, 1.95c to 2c; soft steel bars, 1.95c to 2.10c; steel sheets, in carloads, New York, No. 28 black, 3.05c to 3.10c; galvanized, 75 and 7½ off.

The Metal Market.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
519 MONADNOCK BLOCK, Feb. 24.

Buying of all metals has been good during the week under review, and the market closed strong. In view of the peculiar conditions existing in railroad circles, there is a disposition on the part of smelters to buy only for immediate wants. This has aided in stiffening prices, and Lake Copper, carload lots, Chicago, is quoted at 13c to 13⅛c, and smaller quantities, 13¼c to 13½c. Pig lead is without change as to price, and is quoted 4.05c in 50-ton lots, 4.07½c in carloads, and 4.10c in smaller lots. Pig tin is 31c. Spelter, 5c for carload lots, and 5½c to 6c for lesser quantities. Sheet zinc, carload lots, 6¼c, and 6⅜c in 600 pound lots. Antimony, 10¾c to 11c for Cookson's, and 9¾c for Halletts in small quantities. Selling prices of old metals are as follows: Copper wire, $11; heavy copper, $10.75; light copper, $9.75; red brass, $10.75; yellow brass, $8; light brass, $6.75; lead pipe, 3½c; zinc, 3c to 3¼c.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1909, No. 150 NASSAU ST., Feb. 24.

PIG TIN.—The market during the week suffered a slight reaction, chiefly because speculative interests did not appear at all anxious to manipulate it. The trade situation shows demand to be slow, but bullish reports are promulgated with great regularity. In London the market for the week under review was reactionary. Today's closings at the Metal Exchange were as follows: Spot and February, 29.35c to 29.50c; March to May, 29.40c to 29.60c. London closed today as follows: Spot, £132 15s; futures, £133 12s 6d. Arrivals at Atlantic ports to date aggregate 3,150 tons, and the same tonnage is afloat.

COPPER.—The same influences which have been at work on this metal for several weeks past, were again in evidence during the week. Their operations were quite fruitful, and copper at 13c, which has been a myth for practically a fortnight, became a reality, and as a result a decided impetus has been given to the old prediction that it will sell at 14c later on. Consumers do not show the slightest disposition to purchase on the advance, contending that the strength the metal recently developed is artificial and calls for judicious buying, and then only to meet pressing wants. The Copper Producers' Association having formally decided to withhold statistics of production in the future, the trade interprets its action as equivalent to its extinction. The probabilities are, however, that some semblance of an organization will be maintained for a little while anyway. Trade and Wall Street reports regarding the statistical situation in the metal still continue to show a wide variance, and the efforts of the latter to destroy the former provoke amusement in well informed quarters. The London market during the week was strong, and prices advanced considerably, closing prices at the Metal Exchange today were as follows: Lake and electrolytic, 13 to 13¼c; casting, 12¾ to 13c; standard, 12.50c nominal. London closed today as follows: Spot, £58 15s; futures, £58 17s 16d. Exports for the month to date are small, amounting to only 4,711 tons.

LEAD.—Without change, lots of 50 tons or more selling 4.12½c. St. Louis is still quoted at 3.97½ to 4c. London is stronger at £12 3s 9d.

SPELTER.—A strong situation exists at 5.00c to 5.10c. St. Louis is unchanged at 4.87½c. London is £21 7s 6d.

ANTIMONY.—The market is without change, Cookson's being 8½c to 8¾c; Hallett's, 7c; and other brands, 6¾c to 7c.

NICKEL.—Large lots can be had at from 40c to 50c, and smaller lots at from 50c to 60c.

QUICKSILVER.—Jobbers only are in the market, and sales have been made on the basis of $48 per flask in lots of 100 flasks. London, £8 15s.

At the regular monthly meeting of the Engineers' Society of Western Pennsylvania, held at Pittsburg, Pa., on Tuesday evening, Feb. 17, eighty-seven new members were elected. At this rate the society will have a membership of 1,000 before the end of the year. Prof. S. U. Stratton, head of the United States Bureau of Standards, of Washington, D. C., presented the paper of the evening. He stated that upon the completion of the new buildings now being erected for his department his work would be greatly facilitated and with the employment of more experts the work for the manufacturers of this country would be greatly extended. On Friday evening, Feb. 27, the annual banquet of the society will be held at the Schenley Hotel, and it promises to be well attended.

It has been announced at the office of theStructural Steel Car Co., Canton, O., that notice has been received from the Eastern capitalists with whom negotiations have been on for several weeks for the slae of $500,000 worth of stock in the company, that the deal had been closed, and that on March 17 the company will be reorganized and recapitalized. Immediately upon the reorganization of the company the capital stock will be increased to $10,000,000, and plans perfected for the enlargement of the plant proportionately.

The American Equipment Co., with a nominal capital of $100,000, has been incorporated under the laws of New Jersey. This is the much talked of railroad equipment company organized for the purpose of consolidating a number of the leading equipment concerns of the country. The incorporators are officers of the New Jersey Corporation Trust Co. Chas. S. Leeds, the promoter, declined to discuss the plans of the company.

Lewis S. Hoyt, of New Castle, Pa., has appealed to the Pennsylvania supreme court from a decision rendered against him in a suit against the Shenango Valley Steel Co., one of the companies merged into the National Steel Co. when that company was organized. Hoyt brought the suit to recover 162 shares of Shenango Valley Co. stock alleged to be due him.

The Hartford & New Haven R. R. has awarded contracts for 12 steel bridges in Fall River to the Boston Bridge Works and to the McClintic-Marshall Construction Co. of Pittsburg.

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A WORD ON RESERVE STOCKS OF IRON.

After a silence of a good many months the pig iron storage warrant propaganda is heard from again. The surprise is that it has not been more clamorous in these months of scant pig iron stocks and strong prices. Its latest utterance is thus phrased in a New York financial column, and is offered as the opinion of "one closely connected with the iron trade:"

"The lessons taught by the conditions of the iron market during the last four years have made a deep impression upon all business men. Consumers now realize that there must be accumulated in future a reserve stock of iron, which can be called upon when the demands of consumption so greatly exceed the rate of production. It is believed that in future consumers will very largely insure the regularity of their supply by carrying a reserve stock of iron by warrants, which they can cancel upon an hour's notice, and thus quickly secure iron needed when furnaces are unable to supply it.

"Producers, on the other hand, have not only ceased to fear any bad effect from such an accumulation, but have been thoroughly satisfied that no matter how large a stock of iron may be accumulated in warrant yards during any dull period, this stock will all be exhausted by legitimate consumption during a season of revived industries. The experience of the last four years has thus prepared the way for both producers and consumers working in harmony to build up the warrant system in the future."

There is less reason now for believing that the minds of producers and consumers are running in the channel indicated in the above, than at any time since fluctuations in the price of iron have been a matter of history. The proposition to provide a storage reservoir of iron and hang it over the market has been presented to the American iron trade in one alluring form or another in the past 25 years, and the iron trade has steadily said it would have none of it. It was at first presented as a means of relieving the necessities of hard pressed furnace companies, and a number of such producers put their iron behind a fence and raised money on it. Later it was brought out as a philanthropic effort to save the entire trade from the baneful effects of booms with their inevitable reactions.

We do not recall that the interested sponsors for the warrant yard have ever suggested what seems to us a very necessary adjunct of the system, if it should be established, namely, a second accumulation of iron to stand behind the warrant yard stock, and prevent the rise in prices that would result from the exhaustion of the latter. To be sure, the warrant stocks would help to steady the market when the sudden rush of demand, as in 1899, swept up regular furnace stocks like chaff before the wind; but what would there be to do the steadying when the steadier is gone?

Whatever there is for the consumer in assurance of a regular supply of iron, he will be very apt to provide it for himself in the light of the experiences of the past 18 months. The coal famine has taught the consumer the value of a constant supply, and it may be expected that several months' output will be distributed hereafter throughout the country, until dealers, manufacturers and individual consumers fall again into the old habit of close dependence upon the original source of supply. It will be the same way with pig iron. Foundries and steel works will carry larger stocks than ever, when they are again able to accumulate iron; but gradually the drawbacks of the worst railroad embargo in a generation will be forgotten and the necessity of reserves will pass away.

The consolidations more than any other factor in the iron trade are calculated to secure freedom from violent fluctuations. They have done much in this direction already, and as years pass their value to the entire trade in the preservation of an even keel will be better appreciated. Meantime warrant stocks, that had accumulated to the extent of 200,000 to 300,000 tons, have disappeared, just as other stocks dwindled and disappeared. As a guarantee against fluctuations they were only good as far as they went; but the trouble was and always will be that when the pressure comes there is nothing to guarantee the guarantor. And when the pressure is off and regular stocks increase, the consumer hasn't the slightest trouble about either supply or price.

LESSENED DEMAND FOR TIN PLATE LABOR.

Last week the time expired during which sub-lodges of the Amalgamated Association could present suggestions for modifications in the scale, to be considered at the forthcoming national convention. What suggestions have been filed will be kept secret but it is presumable that they do not recognize the gravity of the situation which confronts the organization. Its strength is largely among the sheet and tin plate workers, and it is patent that in these trades conditions have never before been so ripe for a change, which will appear from a brief summary of recent developments.

After the American Tin Plate Co. and the American Sheet Steel Co. were formed, the one at the close of 1898, the other early in 1900, no immediate results followed as affecting the "skilled" labor, except that in the summer of 1899 an advance in tin plate wages was granted, which it is safe to say would not have been given had it not been for the consolidation. Otherwise, it required some time before methods of cost accounting at different plants could be harmonized, after which some time was consumed in giving each plant the opportunity, under consolidated control, to see if it could better its costs and bring them close to the ideal which had been formulated by culling the best results from all the records. Then followed a gen-

eral period of abandoning and dismantling the poorer plants, and improving and enlarging the better plants. The American Tin Plate Co. started on Jan. 1, 1899, with 39 plants, containing 279 mills. Since that time four plants containing 36 mills have been acquired, two from the outside, one from the American Sheet Steel Co. and one through the Union purchase by the steel corporation, making a total of 43 plants and 315 mills. There have been abandoned 18 plants, containing 71 mills; two plants containing 9 mills have been sold, and at one other plant six mills have been diverted to another use. This would bring the original number of mills down to 229; but there have been additions made at eight plants, involving 35 mills, so that the company now has 23 plants, containing 264 mills. Of these 23 plants 17, the best and largest, are this week in operation, with 227 mills.

It is not necessary to summarize in such detail the operations of the American Sheet Steel Co. Being by 15 months a newer organization the work of reconstruction has not progressed so far, but it has been in exactly the same direction. What we desire to point out in the present connection is that from 43 plants, widely scattered, all but one or two of which had been operated at least spasmodically within a year prior to their acquisition by the American Tin Plate Co., the number has dwindled to 23. These plants, it must be noted carefully, are not being operated spasmodically. Following the period of dullness last year, each plant put in operation has been kept in operation. A plant idle for four or six months, when started, has since been operated without the loss possibly of a single day. There has been no rough guessing or estimating as to what plants should be operated. The actual figures of results furnish the absolute criterion, costs being figured down to a cent a ton. In one town are two plants, one containing but one more mill than the other, and both to the causual observer equally equipped, yet one has been running steadily for months while the other has not turned a wheel. When demands increase, and the cold figures show that it is the latter's turn, it will be put in steady operation.

The peculiar opinion that dividends could be paid on "watered" stock by maintaining fictitiously high market prices, irrespective of production, rather than by the actual making and selling of steel products, led to the erection of a great many "independent" sheet and tin plate mills, which were to make the product, while the function of the leading interest was simply to maintain prices. Other, but much fewer, interests, built on the more solid foundation of a known supply of raw materials and a known market. However, the net result has been the erection of a large number of additional mills, while the demand for sheets and tin plates, under the most favorable conditions, could at best but slightly exceed the productive capacity of the consolidations.

It might be reasoned, off hand, that the changes made by the consolidations and the erection of "independent" mills do not affect the status of the skilled workers as a body. The demand for sheets and tin plates being actually greater than before, it is apparently only the minor question of where the workmen should find employment. That such reasoning is radically and entirely fallacious is what we desire to emphasize.

The operation of a large number of plants under individual ownership was a case of one plant being idle one week or one month, and in operation the next. Sometimes the week would not be worked out. From insufficient equipment, from a great variety of sizes worked each week, and from other causes, the output per mill was not as great as it is now. One mill stood alone under the old regime, in that it accepted nothing but orders involving regular sizes, usually at a concession, and operated fuller time than any other in the country, making a satisfactory profit. A large number of bodies of men, whose employment was intermittent and uncertain, has been succeeded by a smaller number of bodies, whose employment is strictly regular, but interrupted by periods of idleness involving months instead of days. This phase of the present situation has actually reduced the number of men required to make a larger output. Each mill turns out in the course of the year a larger product than formerly.

Another and even more important phase of the situation is that the changes we have outlined have resulted in a great increase in the number of "skilled" men. Where one plant has been abandoned and another enlarged, the extra men required for the latter have frequently been produced by promotions, increasing the total number in the country. Where independent mills have been built, their crews have been recruited partly by men not theretofore recognized as regular members of the craft. The Monessen plant has been increased from 9 to 24 mills, filled largely with men not formerly skilled tin plate workers. The strike of the summer of 1901 removed from the union ranks a number of mills, now operated largely by men not formerly skilled workers in the regular acceptation of the term.

Thus the result of the past three or four years has been to decrease considerably the number of jobs, while increasing very largely the number of candidates for these jobs.

Something has been done towards meeting this condition. Where one man formerly held a job alone, the job is now shared by more than one. Floating crews have become frequent practice; level hand and standing turn men are common, and many rollers and heaters employ helpers where formerly they did not. These practices cannot be defended as sound economics. It is argued that the work is so laborious that a division of labor, or the employment of helpers, is desirable. So it might be, were the limit of output abolished or suitably increased. As it is, there is no sound defense. With all these expedients, and with the arrangement made last fall to capture a portion of the tin plate drawback trade, an arrangement which is in operation and under which considerable quantities of drawback plates are actually being made, there is a large number of skilled tin mill and sheet mill workers idle as to their chosen occupation. Some are doing common labor at a dollar and some cents a day; others are doing a little better, but all are looking to the day when they will have steady employment at their trade, a day which it is practically certain will not come.

A temporary expedient, which would unquestionably greatly improve the present situation, would be to abolish entirely the limit, push each mill to its entire capacity, and then employ on the mill as many men as needed. This might be done by increasing the number of turns from three to four, by the general employment of helpers, or by other expedients now practiced in a limited way. It is for the Amalgamated Association, however, to take the matter in hand and make the division of labor actually compulsory, as it is now simply the spirit of the organization, which spirit is being generally violated.

Ultimately, however, we see nothing in the situation but a necessary and large reduction in the number of men in the craft, proportioned to a given annual output, accompanied or shortly followed by a general revolution in the methods of rolling sheets and tin plate.

LAKE SUPERIOR IRON MINES.

In regard to the discovery of iron ore in the Algoma district, Ont., referred to last week, additional information has been obtained. The present owners of the claim are Hon. John E. Burchard, president of the Burchard-Hurlbut Investment Co., St. Paul, Minn., and Chas. C. Williams, of Sault Ste. Marie, Mich. Mr. Burchard has thus far expended $8,000 on the property and having unlimited confidence in the future of the claim and ample capital to develop it, he is now negotiating for the purchase of a diamond drill, which will be working in 60 days or less, unless the work now in progress should warrant the sinking of a working shaft without drilling, which from present indications seems probable. The formation is a chloretic slate, varying in width from 50 to 300 feet, being bounded on the north by diorite and on the south by cyanides. South of the granite is another slate formation which is bounded on the south by quartizite. The iron ore lately located was recently analyzed with the following results: Metallic iron, 64.45 percent; manganese, 0.581; alumina, 2.060; sulphur, 0.015; phosphorus, 0.009; titanium, no trace; silica, 4.293. This assay was made by Dr. N. Lehnen, of J. J. Hill's labratory, at St. Paul, Minn. The Wagner-Brietung mine is about 1½ miles west of these lands, across Loon Lake, and is on the same formation, which is easily traceable all the way to and from the lake. The work on these lands has been under the supervision of Charles W. Jessup, of Sudbury, and explorer of many years' experience. The force will shortly be increased and the work prosecuted night and day.

At Mellen, Wis., a company has been formed to explore the Penokee iron range. The men identified with the company are John F. Scott, Edward Bekken, John Hedman, and George Pulcifer, of Ashland; S. E. Carrier, Oakfield; James Guest, Hurley; J. R. Whittaker and A. W. Petersen, Mellen; James M. House, Watertown, S. D. The company has already started operations two miles west of Penokee gap.

The rush of prospectors to the iron ore fields on the Highland range about twelve miles north of Two Harbors, Minn., continues. During the past two weeks, the state auditor has issued over a hundred permits to prospectors to explore on school lands. The state receives $25 a year for each permit, and if ore is discovered and a mineral lease issued, the lessor agrees to take out a given quantity each year and pay the state a royalty of 25 cents a ton.

A large vein of ore it is reported, has been encountered in the Minnewawa property, Gogebic range. A vein of slate ore has just been gone through, but it is too badly mixed to be of value, the percentage of iron being too low to furnace. A long drift is being run north on the 300 feet level, and is at present in jasper.

Obituary.

Wm. I. Taylor, of the Taylor Iron & Steel Co., Highbridge, N. Y., died Feb. 17, aged 67 years.

Wm. R. Trigg, founder of the Richmond Locomotive Works and Trigg shipyards, Richmond, Va., died Feb. 16.

Charles Davenport died at Watertown, Mass., Feb. 14, aged 91. For many years he was senior member of the firm of Davenport & Bridges, car builders, Cambridge, Mass.

The Reading Foundry Co., Reading, Pa., has purchased additional ground adjoining its North Reading Works, and now has a tract of about 17 acres. The company contemplates dismantling its West Reading works and constructing an entirely new general foundry, machine shop, power house, pattern shop and pattern storage buildings, together with a suitable office building for the entire consolidation of the business on the one tract of ground. The company will spend approximately $250,000 in new construction and alterations to its present pipe foundry.

PERSONAL.

Benedict Crowell, of the firm of Crowell & Peck, Cleveland, recently returned from a trip to Canada for the examination of mining properties and is now on his way to Cuba to look after mining interests.

At the regular meeting of the directors of the Pittsburg Coal Co., held last week at Pittsburg, H. C. Frick resigned as a director and W. R. Woodford, second vice president, was named in his place.

F. R. Switzer, who for some time past, has been identified with the purchasing department of the Pressed Steel Car Co., with headquarters in Pittsburg, has resigned to accept the position of assistant treasurer of the Salisbury Steel & Iron Co., of Utica, N. Y.

George A. Newett, editor of *Iron Ore*, Ishpeming, Mich., is now at Bisbee, Arizona, on a tour of observation among the mines in that district.

Henry L. Cooke, division superintendent of the American Sheet Steel Co., having charge of the plants at Bridgeport, O., and Cambridge, O., has resigned.

F. A. Vogel, general manager of the Florence Iron River Mining Co., Florence, Wis., has been appointed manager of the mining interests of the banking house of Ladenburg, Thalmann & Co., of New York, in Mexico and Central America.

C. T. F. Benson, formerly of the Brown & Sharpe Mfg. Co., Providence, R. I., has been appointed manager of the Manchester works of the British engineering firm of Craven Brothers.

George M. McGinnis, at present assistant auditor of the American Sheet Steel Co., has been appointed to succeed I. M. Scott, whose resignation as auditor becomes effective on March 1. R. J. Hadley has been appointed assistant auditor.

It is reported that at the next annual meeting of the Crucible Steel Co. of America, Reuben Miller will resign as president and will be succeeded by Frank B. Smith, at present general manager of all the company's properties. No official statement concerning the proposed changes has yet been made.

The following appointments for the works of the Sharon Steel Co. have been announced by the United States Steel Corporation: John Reis, general superintendent of blast furnaces, blooming mill, plate mill and open-hearth; T. A. Harris, head clerk of same departments; W. E. Chadwick, of Pittsburg, superintendent, and F. Rennebaum, of Cleveland, chief clerk of the rod and wire mills. These appointments are effective March 1. Mr. Reis has been superintendent of the New Castle plants of the National Steel Co., Mr. Harris acting secretary of the Sharon Steel Co., and Mr. Rennebaum chief clerk of the H. P. Nail Works, Cleveland.

Louis Allis, formerly of the Allis-Chalmers Co., has been elected vice president and general manager of the Horseshoe Mining Co., South Dakota, to succeed E. M. Holbrook, of Chicago, who recently retired from active official position with the company. Mr. Allis will have headquarters in Milwaukee, but will spend much of his time at Deadwood, S. Dak.

Chas. M. Schwab, president of the United States Steel Corporation, arrived in Paris from Cannes, Feb. 22, accompanied by Mrs. Schwab and her mother. Shortly after Mr. Schwab's arrival he was joined by his father and mother, who have been traveling in Germany, and the party are to sail for New York on March 11, reaching New York March 17.

The Llewellyn Iron Works, of Los Angeles, Cal., are to be equipped throughout for driving by electric motors. Induction motors will be direct-coupled or belted to lathes, planers, and other machinery, and line shafting will be entirely done away with. The Pacific Light & Power Co. has recently purchased from the Westinghouse Electric & Mfg. Co. for this plant 20 induction motors, ranging in size from 2-horsepower to 75-horsepower, which are now being installed.

EXTENSIVE ADDITIONS OF JONES & LAUGHLIN STEEL CO.

Owing to the successful operation of its Talbot open-hearth furnace, the Jones & Laughlin Steel Co. has decided to erect additional furnaces of this type so as to increase its steel production 2,000 tons daily. The furnaces will be erected at its plant on the South Side, Pittsburg. During the past week the present furnace produced 1,400 tons of steel averaging 200 tons daily. Owing to the short time that this furnace has been in operation and the mechanical difficulties that had to be overcome in a furnace of this size this output is considered remarkable. It is estimated that ultimately this furnace will produce fully 2,000 tons a week. In order to secure a production of 2,000 tons of steel daily by this process it has been decided to install six and possibly seven additional furnaces of this type. Owing to the scarcity and the prevailing high prices for scrap that is required in the ordinary open-hearth operations it was decided to make the increase in the Talbot type of furnaces, in which no scrap whatever is required. Owing to the great increase in open-hearth operations all over the country there is now hardly sufficient desirable material to supply the demand.

Last week options were closed for the purchase of two city blocks adjoining the South Side plants at a price approximating $750,000. This property is to be used in further extensions to the present mills. Structural mill No. 11 is to be moved and modernized. At present it has an output of about 250 tons daily but when rebuilt it is estimated that this output will be increased to 500 tons. More room was also required for the erection of the combination rail and billet mill contracts for which have already been placed. This mill will have an output of about 2,000 tons daily. The structural fitting shop is also to be removed and considerably enlarged. By the purchase of this additional property room has been provided for the erection of the additional Talbot furnaces. It has also been definitely decided to erect two additional stacks at the Eliza plant on Second Ave., increasing the number of furnaces at this plant from four to six. Work on the briquetting plant adjoining the Eliza stacks has already been commenced by the Henry S. Mould Co., of Pittsburg, and it is expected that the first briquettes will be available in about six months.

It is doubtful if any of the new plants will be producing in less than a year, although the rebuilding of the structural mill will only require a short time. It is also reported that the company will again become a factor in the rod market as the erection of a modern rod mill to supply the demands of the numerous independent wire mills is being considered.

The Butler Foundry Decision.

The supreme court of Illinois has rendered a decision which upholds that part of the Illinois anti-trust law which requires an affidavit each year from all corporations certifying that they do not belong to trusts or conspiracies in restraint of trade or have not violated the Illinois statute. The case was originally brought by the people on relation of Deneen against the Butler Foundry Co., of Chicago. The Cook county courts declared the law invalid, but the supreme court reverses and remands the case.

The issue passed on in the case against the Butler Street Co. is involved in 469 other cases which have been pending in the Circuit Court since the attorneys for the state and for the corporations decided to make a test of the law in the Butler case. These suits were commenced in June, 1902, and at that time the corporations attacked were sued for the recovery of $50 fines for each of the 163 days which, up to then, had elapsed since they had failed to file with the secretary of state affidavits declaring that they were not in a trust.

Neiman & Stokes, iron founders, Reading, Pa., have moved their plant to Harrisburg, Pa. The firm name will hereafter be Neiman, Smith & Co.

METALLURGICAL SECTION OF THE A. F. A.

Complying with the request of *The Iron Trade Review* for a statement as to the work and aims of the recently formed Metallurgical Section of the American Foundrymen's Association, the secretary, H. E. Field, of Ansonia, Conn., has furnished the following:

"The Metallurgical Section of the American Foundrymen's Association is at present engaged in collecting, classifying and editing the methods of analyses for iron, used in the various iron works in the country. The American Foundrymen's Association desires to adopt a series of standard methods for the analysis of iron, in order to eliminate any error due to difference in methods. The one great argument against the use of chemistry for the grading of iron has been that the work of chemists varied so much that it was impossible to obtain anything like uniform results. The American Foundrymen's Association, in order to overcome this, instructed its standardizing committee to take steps towards the adoption of standard methods for iron analysis. Upon the organization of a Metallurgical Section, this matter was referred to it, as a body better fitted to carry out this work.

"The section is also engaged in enlarging its membership and increasing the interest in its work in the general iron trade. The advent of metallurgy and chemistry as a part of foundry and furnace practice was so sudden and its progress has been so rapid that its growth, figuratively speaking, may be said to be somewhat 'rank.' The tares and the wheat have grown up together. This has been especially true in regard to foundry practice. Ignorance of the subject has made people credulous and the demand for articles and books treating on this line of work is so great that much is put out by writers quite ignorant of their subject. This matter is accepted as truth by founders and when the experiment fails, chemistry is blamed rather than the untruthful exponent. The founder is thus obliged to go to a considerable expense of time and money to find out for himself what is true and what is false amongst the literature on this subject. The equipment of many foundries does not permit this experiment work and thus chemistry, in many instances, has received a setback.

"One of the duties of the Metallurgical Section will be to separate the good from the bad for its members. Metallurgical problems arising from time to time will be considered and acted upon by the association; fallacies now hindering the progress of metallurgy in iron work will be investigated and shown in their true light, by conclusive proofs derived from impartial and painstaking experiments. The facts which are proved to be true will have the stamp of authenticity placed upon them and they will become foundation stones in building up metallurgy into a stronger position in iron work. The Section is designed to be a live active agent in carrying forward the metallurgy of iron. It will act as the representative of all engaged in such work and will endeavor to combine the practical and scientific in such a manner as to be of great value to its members."

A plan is being formulated at Baltimore to consolidate the South Baltimore Car Works, the South Baltimore Foundry, the Ryan & McDonald Mfg. Co., and the National Supply Co., all at Curtis Bay, and several new plants. It is proposed to organize a new company with a capitalization of $3,000,000 to take over the properties of the four companies and make the improvements. This plan has grown from the proposition made to a number of local capitalists last October to establish a large plant in Baltimore for the manufacture of steel castings. Charles T. Crane, president of the Farmers & Merchants' National Bank and chairman of the Board of Directors of the South Baltimore Car Works, is in charge of the project.

An order has been received by the American Steel Foundry Co., St. Louis, from Scotland for 20 steel cars. The cars will be ready for shipment within 20 days.

275-POUND JUSTICE HAMMER.

The illustration is a view of what is known as the 275-pound Justice hammer, of Williams, White & Co., Moline, Ill. The shipping weight of this hammer is 11,200 pounds. As appears from the cut it is strongly and massively built and is capable of doing heavy work.

EASTERN PENNSYLVANIA.

HARRISBURG, Pa., Feb. 23.—Fuel shipments have been maintained at a satisfactory rate in most districts in spite of zero weather, and the mills and furnaces are running as full as they can and are making large products. The shipments from this city, Lebanon, Reading and the iron section of the Lehigh Valley have been larger this month than for some time.

275-POUND JUSTICE HAMMER.

The Pennsylvania Steel Co., The Susquehanna Iron & Steel Co. and the Bethlehem Steel Co. have all of their plants in operation again and the prospects for the remainder of the year are generally good. They will blow in additional furnaces before long.

The Harrisburg Foundry & Machine Works will be one of the constituent companies of the new Federal Power Co., which is to be composed of a number of engine building concerns east of Chicago. The details have not been announced yet, but will be before very long.

The new foundry of Neiman, Stokes & Co., at Reading has been started.

The Wilkinson Shear & Cutlery Co. is to be formed to absorb the Wilkinson Shear Works of Reading and the Gettysburg Cutlery Co.

The Middletown works of the National Tube Co. have been started after a short suspension due to non-arrival of material. The works are running on export orders.

The Eastern Steel Co., of Pottsville, whose plant is located on coal land, is arranging with a company which will mine from under the mills. The company has started part of its rehabilitated plant and other branches are being prepared for resumption.

The Central Iron & Steel Co. mills in this city have been making between 3,200 and 3,400 tons of plate per week. Contracts for California firms, one for seven miles of pipe steel, have just been completed. The mills will have a great deal to do this spring.

J. Harold Wickersham has been appointed receiver of the Chafant Mfg. Co. at Lancaster.

The American Car & Foundry Co. has begun an interesting suit in Blair county. The Beech Creek & Altoona Railroad Co. contracted for six cars and as the bills were not paid, the car company sues for the return of the cars. The case has already attracted considerable attention.

The Loyd Iron & Steel Co., of Pittsburg, has been chartered here with a capital of $1,000, which is to be increased. The incorporators are Wilmer D. Loyd, Beaver Falls; H. C. Van Norman and W. R. Blatt, Pittsburg. The Windsor Machine Co., of Philadelphia, has been chartered with a capital of $15,000.

The Empire Steel & Iron Co. has completed extensive repairs to some of its furnaces and they will be added to the active list this year.

F. A. Grueber has been elected president of the Grueber Mfg. Co., of Bethlehem.

It is said that there are to be a number of changes in the Tidewater Steel Co.'s plant at Chester. The personnel may be changed and extensions made.

John Y. Boyd was elected president of the Tyrone Iron Co. here last week at the annual meeting. O. M. Copelin was elected secretary.

The Bath Foundry & Machine Works, of Bath, will shortly be incorporated. The new organization has leased a foundry building and will install machinery.

It is said that the Baldwin Locomotive Works are interested in a plan to erect a steel plant at Eddystone, near the Gruson Iron Works. The plant will be for the manufacture of special steels.

The Lebanon Valley Iron Co. will start a small finishing mill at Lebanon in a short time.

The Reading Iron Co. is practically rebuilding its plant at Reading. Two new mills, one a pipe mill, are being built and a mill for making larger pipe is being planned. The company did a business of $15,000,000 last year, and has rebuilt two mills, a forge and a rolling mill within two years. A large power plant is being erected.

The Diamond Drill & Machine Co. will erect a large storage and pattern shop at Birdsboro.

The strike of the iron molders at the plant of the York Mfg. Co. at York has been settled after two years' struggle between the molders' union and the company. The union gained some advantages.

The new officers of the Lebanon Chain Works are: Eli Attwood, Lebanon, president; John C. Schmidt, York, vice president; William Robertson, Lebanon, treasurer, and Peter Wertz, Carlisle, secretary. Directors, the officers and George S. Schmidt and C. L. Hoff, York.

The Firth-Stirling Steel Co., Pittsburg, has increased its capital stock to $700,000 from $600,000; the Alan Wood Iron & Steel Co. from $1,250,000 to $1,550,000, and the Keystone Drop Forge Works from $50,000 to $150,000. The increases are to cover improvements.

The Dauphin county court will be asked to dissolve the Paxton Iron & Steel Co., whose property has been taken into the Central Iron & Steel Co. in this city. The Paxton company had the Paxton furnaces and a rolling mill, all of which are now owned by the Central company.

The National Forge Co., of Pittsburg, Pa., is to be incorporated under the laws of the State of Pennsylvania for the purpose of operating a forging plant. Andrew McMillen, Andrew Lyle, E. Baillie, H. H. Francis, W. C. Burgum, W. E. McMillan and C. E. Long are the incorporators.

CONFERENCE BETWEEN MOLDERS AND N. F. A.

The Detroit conference of last year between representatives of the National Founders' Association and the Iron Molders' Union adjourned, it will be recalled pending the presentation of the matters before it to the annual convention in November of the N. F. A. The adjourned meeting of the conference was held in Cincinnati Wednesday and Thursday, Feb. 18 and 19. There were present on behalf of the National Founders' Association its president, F. T. Towne, of Stamford, Conn., and Antonio C. Pessano, of Detroit; C. Birmingham, of Kingston, Can.; William H. Pfhaler, of Philadelphia; and Commissioner John A. Penton, of Detroit. The representatives of the molders were President Martin Fox, Vice President Joseph Valentine, John Loder, of Pittsburg, John Bradley, of Poughkeepsie, James H. O'Neill, of Providence, and Editor David Black, of Cincinnati.

The matters discussed were those that came before the Detroit conference, namely, the question of a national agreement, the nine-hour day, removal of restrictions on day's work and differentials in wage rates. It was decided that nothing should be made public concerning the deliberations of the conference. Messrs. Pfahler, Pessano, Black and Perrine were appointed a sub-committee to meet in Detroit March 9 to consider further the points at issue and to formulate resolutions which will be presented to the entire committee at a meeting to be held in Cincinnati immediately afterward.

The Tallapoosa furnace at Tallapoosa, Ala., which has been shut down for lack of ore, caused by shortage of cars, has now arranged for a regular supply of low phosphorus brown ore and expects to run regularly on charcoal iron for car wheel purposes.

The Coal & Coke Securities Co., with a capital stock of $200,000, has been incorporated in New Jersey by Frank Lane, Levi C. Goodale and C. A. Wilson, all of Cincinnati. The Securities company is intended to furnish backing, and to promote some coal and coke undertakings in the "Elkhorn" coal fields of Kentucky, a territory which it is claimed has a coke equal to that of Connellsville, Pa. Beyond experimenting upon the coke and developing its qualities, there have been no steps taken towards the erection of the ovens, building lines of transportation, etc. This it is expected will follow in the early future.

Tin plate and sheet workers affiliated with the Amalgamated Association of Iron, Steel and Tin Plate Workers will introduce a resolution at the coming convention of this organization which will throw open all of the non-union mills of both the American Tin Plate and American Sheet Steel Co. to the members of the association. Inasmuch as no member of that organization can be employed in a non-union plant at the present time they are compelled to depend entirely upon the union mills of these two companies for employment. As these mills have not operated more than six months during the past year they argue that it would be far better to throw open all the mills so that the members of the organization can get employment elsewhere when their own plant is shut down.

An unfortunate error destroyed the sense of the concluding paragraph of the description of the Atlas Car & Mfg. Co.'s (Cleveland, O.) steel mining skip, on page 41 of our issue of Feb. 19. It should have read: The car is intended to be dumped from an inclined trestle and is elevated by cable power. At the point arranged for dumping the front wheels pass through an opening upon a horizontal track, while the rear wheels are engaged by two rails of considerably wider gauges, causing them to continue to ascend the incline. By this means the car assumes a sharp angle, thoroughly clearing the contents.

BIRMINGHAM, ALA.

Feb. 24

As compared with the same period twelve months ago the month of February has been a very quiet one in the iron trade of this district. Practically the entire product of Southern furnaces for the first half of the year 1903 was placed before January 1; since that date the market has been in a waiting condition. There has been considerable inquiry for forge and mill iron, but the sellers are generally holding these grades at $17.50 Birmingham. Very little forge is available for prompt shipment. This is accounted for in part by the fact that a great many furnaces have been overhauled the past year, and where they have not been put out of commission for general repairs, extensive additions have been made to the blowing and boiler power. As a result, with uniform supplies of raw material arranged for, with plenty of heat and power, the furnacemen are better able than ever before to control the grades of their output. Old orders are rapidly being cleared from the books, and for such low grade iron as is made the tendency is to ask a good price, or at any rate, not to make what might be considered a sacrifice as compared with the prices prevailing for the better grades. One interest is reported as having sold a round lot of No. 4 foundry and forge for delivery over the next several months, but it is not admitted that more than 1,000 to 2,000 tons were so sold, although some reports place the tonnage at 10,000.

The Southern Car & Foundry Co.'s plant at Anniston, Ala., suffered a loss of $15,000 by fire on the night of the 21st. The gray iron and malleable foundry departments are practically a total loss and the damage may be greater than now estimated. About 250 men will be thrown out of employment. A boiler explosion at this plant some weeks ago resulted in considerable money loss and the death of half a dozen employes.

The Birmingham Paint Mills have increased their capital stock from $3,000 to $50,000, in order to handle successfully their increasing trade. The principal product is paint manufactured from the Red Mountain ores.

The Empire Coal & Coke Co. expects soon to fire up 100 of its 250 coke ovens now under construction at Empire, Ala. The Alabama Consolidated Coal & Iron Co. will have 100 new ovens at Lewisburg, Ala., in service within the next 30 to 60 days, and the Lookout Mountain Iron Co. plans to complete in about 60 days 100 of its 300 ovens now under construction at Valley Head. In addition to the home demand for Alabama coke, which it has been difficult to supply the past nine months, there is a considerable demand for this coke from the Mexican and other Western smelters. For some time practically nothing has been shipped to these Western consumers, but with the increase in producing capacity it is expected more attention will be given this particular trade, as well as the probable invasion of the Cincinnati and Western foundry trade. The Louisville & Nashville Railroad Co. has made effective a very reasonable rate on coke to Cincinnati and St. Louis and common points, and there is a good inquiry at present from such territory.

The Alabama State Land Company has recently sold 2,760 acres of valuable coal lands to the Underwood Coal Co., now operating at Altoona. There is a strong likelihood of the L. & N. R. R. Co. making an extension of its Alabama Mineral branch from Gadsden across to Altoona, connecting there with its Birmingham Mineral Division. This would greatly strengthen the position of iron makers at Gadsden, as it would give them a fuel supply at a freight rate of not exceeding 15c per ton, as against a present rate of 40c to 70c per ton.

Owing to the sinking of the foundation of the stack of the Wheeling Steel & Iron Co. at Martin's Ferry, O., it will be blown out immediately and will have to be practically rebuilt. The foundation commenced to sink during the past few days and for a time there was grave danger that the furnace would topple over before the metal could be drawn off.

150,000 FREIGHT CARS REPLACED YEARLY.

At the annual meeting of stockholders of the Pressed Car Co., held in Jersey City, Feb. 18, the old directors of the company were re-elected. They are classified as follows: Three-year class, A. H. Larkin, F. N. Hoffstot and J. W. Friend; two-year class, Judge J. H. Reed, T. H. Given and G. E. Macklin; one-year class, F. G. Ely, A. S. Mathesen and James A. Blair. The income account and balance sheet for the year ended December 31 last appeared in these columns Feb. 12. At the meeting President F. N. Hoffstot reviewed in some detail the operations of the company in all departments. He said in part: "The volume of business has increased 47.1 percent during 1902. The number of cars built increased 11.7 percent, while the output of truck frames was practically doubled. The number of steel cars built in 1901 showed an increase of 28 percent over the previous year. In 1902 the company was able to build its steel cars with 31 percent fewer men than in 1900, and with 23 percent fewer than in 1901. While the business of the company increased 47.1 percent during 1902 this increase was secured without any substantial increase in the company's plants. During the last six months of 1902 the volume of business done was at the rate of $38,000,000 per annum. The large profits had been secured only by reason of the great volume of business and the close economy practiced in every department. Although the business of the company last year increased 47.1 percent, general expenses increased only 10.6 percent, and general operating expenses only 20.6 percent over the preceding year. It is estimated that there are in this country today over 1,500,000 freight cars on wheels and that 10 percent are replaced yearly, besides the new equipment."

Regarding the outlook for the present year, President Hoffstot says that there is sufficient business booked and in sight to insure the full operation of the company's works during the entire year. With respect to the merits of the steel car, he says it has been in service long enough to show that it runs more miles per year than the wooden car; carries in most instances more than twice the load; is so strong that it is rarely out of repair, and when it is necessary to repair it, costs less than to repair the wooden car.

"The Minerals and Mineral Localities of Texas," a pamphlet of 104 pages, is issued as the fifth in a series of publications designed to set forth the mineral resources of the State. It is published under the auspices of the University of Texas Mineral Survey. Dr. Wm. B. Phillips, director. The present publication is a report by Dr. Frederic W. Simonds, professor of geology in the University of Texas.

The Brown Corliss Engine Co., Corliss, Wis., has recently received orders for the following engines: Two 26x54-inch simple engines for Montello Brick Co., Reading, Pa.; one 14 and 26x42-inch tandem compound engine for the Sheffield Co., Sheffield, Tenn.; one 16 and 30x42-inch tandem compound engine for the Sheffield Co.; one 18 and 36x42-inch vertical cross compound engine for the Louisville Gas Co., Louisville, Ky.

The General Pneumatic Tool Co. recently incorporated, is a re-organization of the business of the machinery department of the Havana Bridge Works, Montour Falls, N. Y., which has been engaged for some years in the production and sale of improved Pneumatic tools. The new corporation will manufacture pneumatic tools, compression riveting machines, pneumatic motor hoists, air compressors, cranes, etc. Extensive improvements in the manufacturing plant have already been made, and an additional building will be erected for a store and engine house, early in the spring. A portion of the new machinery is already in operation, but there are yet to be purchased, screw machines, turret lathes, shaper, Universal grinder, gear cutter, milling machine, and engine lathes. Orders for compression riveting machines, pneumatic hammers, and pneumatic motor hoists covering the company's capacity for several months are already booked. Several new types of compression riveting machines have recently been brought out, in addition to those which have been on sale for several years.

The North Wales Foundry Co., Philadelphia, recently incorporated, will take over the plant of the North Wales Foundry Co. Ltd., at North Wales, Pa., and will also make several additions to the old plant such as new boilers and boiler house, also machinery for making bath boilers, etc. A new boiler is now being installed and the new machinery for manufacturing bath boilers has been ordered from the Michigan Mfg. Co., of Ypsilanti, Mich. The principal goods that the new corporation will manufacture will be gray iron castings for the general trade.

The F. H. Lawson Co., of Cincinnati, dealer in tinners' stock, sheets, etc., will remove from its present quarters on Main St. to the Brighton district. The company has purchased the plant of the Brighton Buggy Co. on Erie St. and C. H. & D. R. R. tracks. This plant is to be remodeled to suit the requirements of the business and the offices and sales rooms will be removed to the new building. The business was founded in 1817 by Thomas Lawson and has been carried on in its present location for 80 years. It is now in the hands of the fourth generation of Lawson of the direct male line. The new quarters adjoin the factory of the company on Eighth St. near the C. H. & D. R. R.

The Martin Carriage Works, York, Pa., have just added some new machinery which largely increases their facilities for manufacturing vehicles and spring wagons. It is characteristic of this firm to add new and improved machinery to replace machinery that is not strictly up-to-date, even though such machinery may not be worn out.

The Keystone Wire Matting Co., Beaver Falls, Pa., reports a satisfactory increase in business the past year, among other new business being the equipment of several battle ships and torpedo boats with the company's original galvanized flat steel wire matting. The company's export business is increasing and it expects to complete arrangements to have its London, England, branch in operation at an early date.

Milwaukee Rice Machinery Co., Milwaukee, Wis., manufacturer and jobber of power transmitting appliances, reports that the demand for its Reliance gas and gasoline engines has been so great that it is unable to fill the orders as promptly as desired. Trade from the Western section of the country has been particularly heavy, the company discovering long ago that it is not so much a question of getting orders as of filling them.

The Brightman Mfg. Co., manufacturer of tinned, rolled and polished shafting, and also machines for turning, rolling, straightening and polishing shafting, will move its plant from Millersburg, O., to Shelby, O., about April 1. The company will occupy the buildings formerly occupied by the American Bicycle Co. at Shelby, at the junction of the Big Four and B. & O. Railroads. The ground and buildings of this plant occupy four acres of which two acres is covered by substantial brick buildings. This plant is all fully equipped with boilers, engines, shafting, etc., to the extent of 500 horsepower. The reason for moving is that the company's business has increased to such an extent that it has been necessary to get into more commodious quarters. The name of the company will be the same but the capital stock will be increased to $250,000, fully paid up. The officers will be as follows: L. H. Brightman, president; G. F. Brightman, vice president; C. W. Brightman, secretary and treasurer.

A TURBINE FLOW RECORDER.

Prof. Charles M. Allen, of Worcester, Mass., presented a paper at the monthly meeting of the American Society of Mechanical Engineers, Jan. 21, on "A Turbine Flow Recorder." The following is a synopsis:

Where water power is sold it is customary to compute the amount of water used from daily readings of gate opening and head and from tables of the discharge of various openings and heads made up from tests of the wheels. The water used is then reduced to mill powers. The mill power at Holyoke is 38 cubic feet per second at 20-foot head; at Lowell, 30 cubic feet per second at 25-foot head; at Minneapolis, 30 cubic feet per second at 22-foot head. In order to get an average, the readings are taken at varying times in the day. The recorder described was designed to take readings at much more frequent intervals, and to register them so that the daily trips of an inspector would be unnecessary.

The fundamental idea of the apparatus is to have the recording dials driven by a train which shall vary both with the volume or weight of water passing through the wheel, and the head under which this weight of water exerts its energy on the wheel. The work of the wheel is—Work = W × h. Both W and h may vary. The device seeks, therefore, to have a gear driven continuously from the turbine, but which shall drive the recording dials during the same proportion of one complete revolution of the gear as the actual head is of the maximum possible head. Or, again, a recording dial shall also be driven during that same proportion of one revolution of a driving gear, as the actual volume or weight of water passing the wheel bears to the maximum weight or volume which can pass it under the most favorable conditions of delivery. This means, then, that the recording dials shall be driven by a converging train from the turbine itself through two variable gears, one of which varies with varying height of head, and the other of which varies with the weight or volume as affected by partial closing of the gate as the load varies. In the actual machine, these variable gears are made cylinders of considerable length of face in relation to the diameter.

In the discussion on the paper, Prof. Allen stated that the turbine flow recorder under consideration was about 18 inches high and stands on a base some 12 inches square; that each turbine or pair of turbines must have a recorder, and that the recording cylinders must in each case be built for the wheel with which it is to work. The mill powers can be gotten by modifying the curve on the upper cylinder, or by registering the head by means of clock-work and a chart, the same as in a recording gauge, then taking the average head.

In the case of the wheel tested at Worcester Polytechnic Institute by means of the recorder shown at the meeting, the curves on the cylinders were plotted from tests made at the Holyoke flume, before the wheel was installed in place, so that the conditions of the original tests and those with the recorder were quite different. Notwithstanding this, it was found that the variation was never over 3 percent and often as low as a fraction of 1 percent.

Mr. George I. Rockwood stated that the practical use of the machine was, probably, at great water power plants such as Holyoke and Lowell, to give fair measure of the power sold to mill owners, avoiding, on the one hand, overcharge by the water power company, and, on the other, sharp practice by the mill owner. In regard to the question of tampering with the meter, of course it can be done, but it is a penitentiary offence; likelihood of such interference could be avoided by sealing up the recorder in a case.

In reply to a question, Prof. Allen stated that, for the case encountered on the Pacific coast, where wheels are supplied by very long flumes, and the head on the wheel depends upon the gate-opening, if the loss of head due to friction in the pipe is constant for each gate-opening, a single cylinder recorder can be used, the curve being modified to allow for this change of head with gate-opening.

The suggestion was made by Prof. Hutton that a somewhat similar form of recorder might be used for the steam engine, but that there would be difficulty with regard to the continually variable pressure in the cylinder, both with initial boiler-pressure, vacuum, and point of cut-off.

Mr. Rockwood spoke of a device in which the engine was so built that the horsepower for any given cut-off was known at a certain pressure. Then, by attaching a pointer to the governor shaft, the horsepower at any time could be read off on a scale, providing the steam pressure did not vary.

These monthly meetings of the society will be continued during March, April and May. The third evening reunion will be held on Tuesday, March 3, at 8:15. The subject of discussion that evening will be "The DeLaval Steam Turbine," and will be started by a paper on this subject with illustrations presented by Charles B. Rearick. On April 7, the subject will be "The Pich Process for Brazing Cast Iron," and on May 5 Prof. C. H. Benjamin, of Cleveland, will report some experiments upon "The Bursting of Emery Wheels." The meeting in May will be the last of the season.

Pig Iron Prodnction in Belgium.

The production of pig iron in Belgium last year showed an increase of 44.1 percent, as compared with 1901. The figures are as follows, in metric tons:

	1901.	1902.	Changes.
Foundry iron	92,700	108,560	inc. 15,860
Forge iron	166,955	256,435	inc. 89,480
Bessemer and basic	505,765	737,915	inc. 232,150
Totals	765,420	1,102,910	inc. 337,490

At the close of 1901 there were 26 furnaces in blast out of a total of 39 in existence. At the end of 1902 there were 33 furnaces in blast, an increase of 7 over the previous year.

The Treasury Department has ruled that on the exportation of pumps and hydraulic machinery manufactured by the Goulds Manufacturing Co., of Seneca Falls, New York, in part with the use of imported pig iron a drawback will be allowed equal in amount to the duty paid on the imported material so used, less the legal reduction of one percent. Regulations for identifying the material are made and it is provided that in liquidation the quantity of imported pig iron which may be taken as the basis for the allowance of drawback may equal the quantity consumed, as declared in the drawback entry, but in no case shall it exceed 75 percent of the net weight of the pumps as exported when made at the No. 1 works of the company, or 30 percent when made at the No. 2 works.

The Consolidated Lake Superior Co. has declined the contract for steel rails offered by the Temiskaming Railway commission. Vice President Theo. C. Search stated to the commission that the blast furnaces of the Algoma Steel Co. were still incomplete, and while there were promises that they would be ready in April, yet the fact that the blowing engines were not ready for delivery rendered the situation uncertain. He further added that the company's contract supply of Bessemer pig from the United States had been exhausted, and it would be unwise to accept the rail contract because delivery could not be guaranteed.

A meeting of the directors of the American Steel Foundries was held last week at which the regular quarterly dividend of 1½ percent was declared on the preferred stock. The earnings are now equivalent to 8 percent on the common stock of $15,000,000, after provision has been made for preferred dividends. The work of enlarging parts of the subsidiary companies is progressing rapidly. The Chicago and Granite City plants have been practically doubled, while extensive additions have been made to the Franklin, St. Louis and other plants. The policy will be to accumulate a large working capital before beginning dividends on the common stock.

Automatic Worm and Screw-Threading Lathes.

There is no operation in the machine shop requiring more care and consuming more time in proportion to its simplicity than the cutting of screw and worm threads. The forming of such threads with dies and taps answers all purposes of speed or economy of production, but falls short of the accuracy which modern practice demands. Most machine tools are now made with all the adjusting, elevating and feed screws graduated to working percision, and the screws themselves must be as nearly accurate as possible. Their production by some method better than the slow and expensive one hitherto employed is demanded, and is occupying the attention of machine designers with varying success. Again, since the advent of the electric motor and its application for driving all sorts of machines, the demand for accurately threaded worms of various sizes and pitches for quick reduction of speed, has also given an impetus to the study of means for rapid and economical production of them. Of course the problem, whether a screw or worm thread is to be considered, is practically the same, but the means to be employed differ largely in the judgment of different inventors.

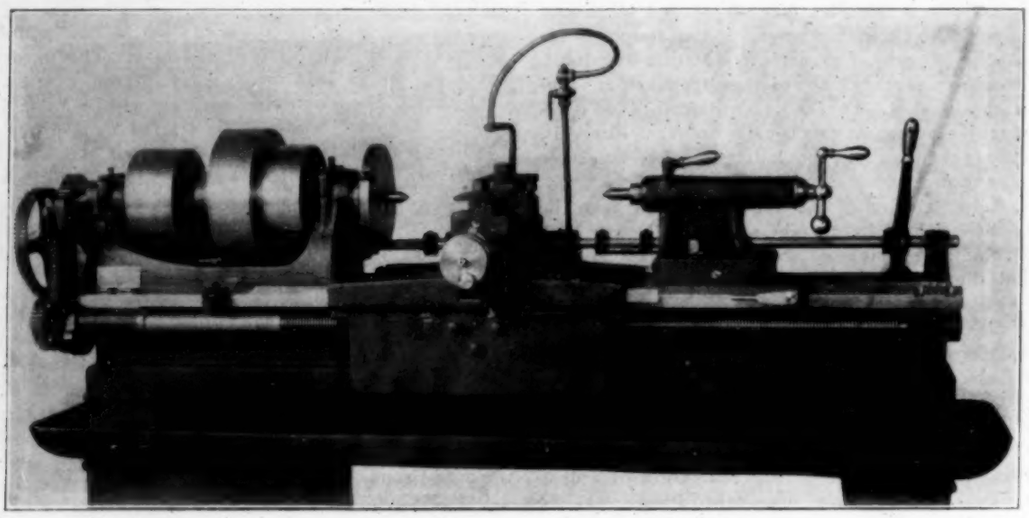

FIG. 1.—FRONT VIEW OF SMALL AUTOMATIC THREADING LATHE.

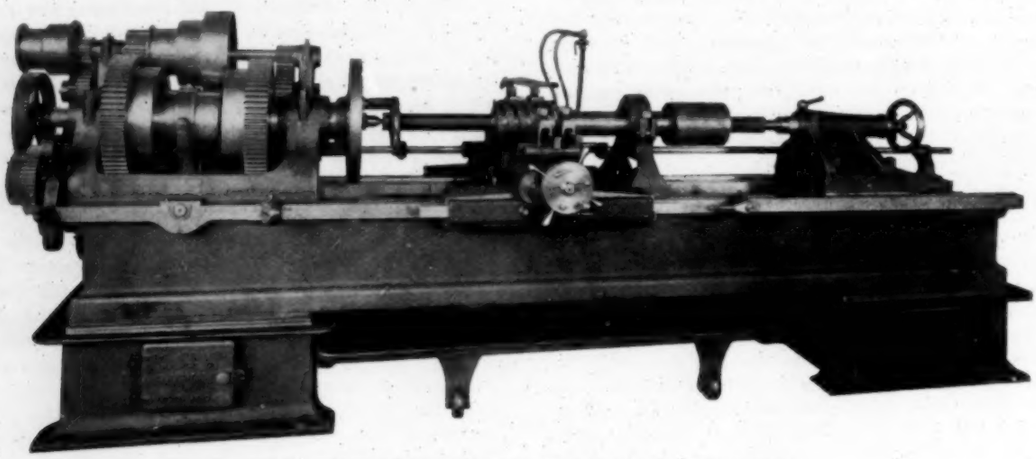

FIG 2.—FRONT VIEW OF LARGE AUTOMATIC THREADING LATHE.

At present there are but two leading plans before the mechanic and manufacturer, by which these important results are achieved—the time honored lathe and the modern milling method. Each has its advantages as well as its disadvantages, and while we do not propose to decide in favor of one to the disfavor of the other, the considerations which the makers of the machine herewith illustrated set forth will be of interest to those who have the handling of the problem.

The mechanic is apt to think that little need be said about the threading tools themselves for forming threads in the lathes. Certainly the man who runs an engine lathe for years has good reasons for thinking he knows best how his tools should be formed and used; but he will admit that wherever he can get an angular or shearing cut, he can remove stock faster and produce a better finish than with a blunt edge and "hogging" cut. We will refer to this later. Few cutting tools will remove stock faster than the circular milling cutter, and because of this its attractiveness is very great, and justly so, if that were the whole desideratum. All threads are not angular, nor external; indeed it is a moot question whether accurately pitched screws should have angular or square threads. With the turning method of production it matters not which may be wanted, while with the milling method, neither external square threads nor internal threads of any form can be produced, neither can threads be cut close to shoulders. We might consequently say at the outset that a comparison favors the lathe method so far as its general application is concerned. Assuming, however, that the first cost of the two forms of threading machines were equal, the matter of subsequent cost of cutting tools, and facilities for sharpening them without distorting their shapes, is vital, and is perhaps the most important to be recognized, in view of the many cutting edges of a milling cutter, and the necessity of a special one for each pitch (not full V) being provided. The comparison is narrowed down to one of economy, instead of accuracy. Inasmuch as screws of absolute ccuracy have for years been threaded with the engine

lathe, it follows that there is no occasion to look for any better method, unless a gain in economy is secured.

There is one more point to be noted while making these general comparisons; namely, the application of power, and the distribution of material in the machines to resist best the strains which the cuts impose.

The lathe is one of the oldest machine tools. It has developed from the experience of thousands of users throughout many years, and may be said to be fully developed; it is at least so proportioned that the heaviest cuts may be taken, up to the limit of the torsional strength of the work between its centers, and the endurance of the cutting tools.

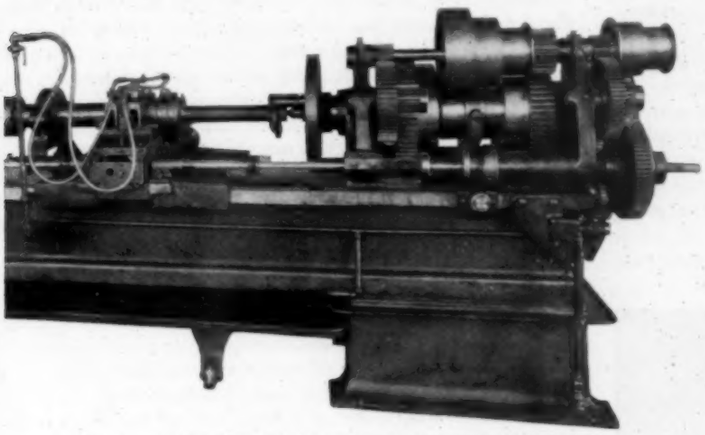

FIG. 3.—REAR VIEW OF LARGE AUTOMATIC THREADING LATHE.

The Automatic Machine Co., of Bridgeport, Conn., who are the makers of the automatic threading lathe, say that the above has been their line of reasoning, and their conclusions were in favor of the lathe when attempting to improve the methods in use for thread cutting; indeed, that they had gone far with designs for milling before becoming fully convinced that the advantages were to be found with the turning process, and their present machines are the outcome of such research.

The cost of power (except brains) nowadays is considered of very little importance as compared with time, which may include initial investment, interest on same, and the cost of maintenance. At least one-half the time is wanted when cutting threads on ordinary lathes. The carriage reverse is but little faster than the cut, and if the thread must be begun, or ended, at definite points, the operator loses time in effecting it. Usually but one cutting point is employed, while there is power enough in the lathe to carry several simultaneously. It follows that if all the movements of the engine lathe, engaged in threading, could be controlled without the attention of the operator—after he had placed the work between the centers—the problem would be solved; and this is what has been done, by means readily understood from the description below and reference to the illustrations.

The automatic threading lathe is essentially an engine lathe fitted especially for threading, and the operator has simply to place the work between the centers and adjust his tools for length of thread and depth of cut. The operator is free over half of his time to attend to other matters while the machine is threading long screws, while on short duplicate work he may care for several machines simultaneously.

Fig. 1 represents the front view of the small lathe. The spindle is furnished with two clutch pulleys, the large for driving and the smaller for reverse, with a spreader block between, actuated by a yoke; the yoke being controlled by the cam shown at the back of head. The cam is fastened to one end of a sleeve, which passes through the bearing cast on the head frame, and at the reverse end supporting a friction pulley, always running in one direction. A back shaft having an end movement, is feathered within the sleeve, so as to revolve with it. An escapement lug is fast to the shaft, which is intercepted during its rotation by coming in contact with a block which holds it against revolving until the shaft is moved endwise, when it escapes and makes a half revolution, coming in contact with another block which again holds it until the shaft is moved in the opposite direction. It will be seen that the semi-rotation of the sleeve and shaft thus provided for causes the cam to perform its office of reversing the spindle movement. The end movement of the shaft is caused by the carriage coming in contact with the adjustable collars on the shaft, this shaft passing through the carriage.

The carriage supports two sliding toolposts which approach and separate by means of a double eccentric within the carriage, which is feathered to and slides freely on the shaft. These eccentrics are hardened and fitted within hardened forks attached to the sliding toolposts.

A reference to the front view will show what is ordinarily the cross feed hand wheel; but in this case the feed screw for the front slide is hollow and threaded "left handed," while that for the rear slide passes through the former and is threaded "right handed." These feed screws terminate at the front of the carriage and each supports a knurled disc, representing the ordinary hand wheel. Behind these two discs is a finely cut ratchet disc, running loosely on its support, and all these discs are locked together at the will of the operator, by means of the locking hand nut shown on the front of them. A swinging pawl is shown extending below the discs, which gets its movement from the sliding bar, passing longitudinally through the apron of the carriage, with ends extending Whenever this bar comes in contact with the adjustable stop dogs, clamped to the bed, more or less movement may be had, according to the thickness of chip desired. The ratio of feed screws and ratchet teeth is equivalent to .001 inch for one tooth, and the maximum feed may be .012 inch per cut and the minimum .001 inch. An adjustable shoe is on the ratchet disc which, when set upon the disc at the tooth representing the predetermined depth of thread, prevents the pawl from taking the teeth when the desired depth is reached, and consequently then the tool feed ceases.

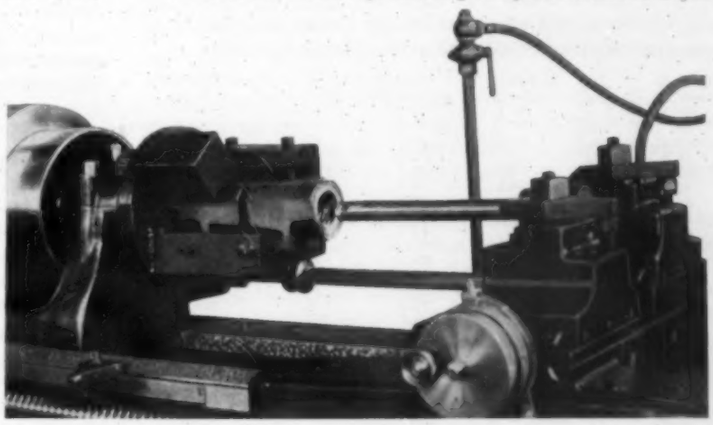

FIG. 4.—AUTOMATIC THREADING LATHE AT WORK ON THE SOLID LEAD SCREW NUTS USED ON THIS TYPE OF MACHINE.

The lead screw nut is long, solid, and self lubricated, as differing from the usual split, opening and closing nut. The direction of spindle rotation is changed at will, by means of the lever shown near the end of the lathe. Change gearing is provided as with the ordinary lathe, also all conveniences for copious supply of oil, by means of pump, tank, piping, etc.

The lathe appeals to machinists as well as manufacturers, because the facilities for the use of two or more tools enable the employment of shearing edges when cutting

V or angular threads, while the use of one tool for each side of a thread results in more rapid removal of stock and a much higher degree of finish.

Referring to Figs. 2 and 3: This is a development of the smaller lathe for heavy work, being heavily geared and with lead screw located in the center of the bed, as near to the tools as possible. Aside from the other special features, due to its wider range and greater capacity, provision is made for the simultaneous use of four tools, all of which, except the entering or roughening tool, are angular with shearing edges, peeling off chips .03 inch thick and 1 inch wide. There is also an original arrangement of chip feed, by which the last few passes of the tools over the work gradually diminish in depth or thickness of chip to zero, this leaving the surfaces smooth and avoiding any lack of true pitch by reason of springing of the stock or tools when nearing the finish of the work.

The worm shown between the centers in Figs. 2 and 3 is 6 inches diameter, 9 inches long, double thread, 3 inches lead, and was threaded in 94 minutes—and left so smooth that polishing was unnecessary. The following table is given by the makers of the lathe as the guaranteed time required to thread one foot length of screw or worm (of any lead or pitch) at 25 feet per minute cut-

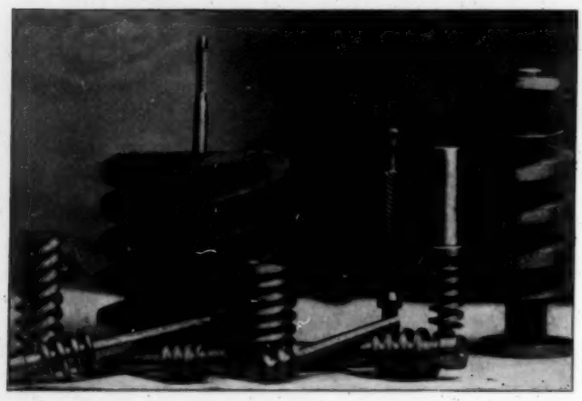

FIG. 5.—WORK DONE IN THREADING LATHE.

ting speed, with a chip feed of .006 inches per cut. It is claimed that the actual cutting time is one-third less.

R. P. M.	Dia.	U.S.Stan. V.	Square.	29 Deg. or Acme.	Worms.
127.1	¾"	15.5m.	11.75m.	15 m.	19.5m.
95.5	1 "	20.4	15.75	19.5	25.74
85.	1⅛"	23.	17.75	22.50	29.
76.3	1¼"	26.5	19.75	25.	32.4
69.5	1⅜"	28.	21.5	27.5	35.6
63.7	1½"	30.5	23.5	30.	38.7
58.3	1⅝"	33.5	25.5	32.50	43.
54.5	1¾"	36.	27.5	35.	45.4
50.9	1⅞"	38.	29.5	37.5	48.6
47.8	2 "	41.	31.5	40.	51.6
42.4	2¼"	46.	35.5	45.	58.3
38.2	2½"	51.	39.25	49.5	64.62
31.8	3 "	61.5	47.	60.	77.5
23.9	4 "	81.5	62.75	80.5	103.2
19.1	5 "	103.	78.5	100.	129.3
15.9	6 "	126.	94.5	120.	155.

The factors and formula for determining the above are as follows: D = Depth of thread; N = Number of threads in 12 inches; F = Feed. Thickness of chip per cut; R = Cutting speed in R. P. M. Then

$$\frac{D \times N}{F \times R}$$ add 50 percent = Guaranteed time in minutes.

The time will of course vary according to the cutting speed and feed.

The lathe is shown in Fig. 4 at work on a solid lead screw nut; the nut being, of course, of the type employed in the construction of this make of machine. The method of chucking as well as the style of threading tool, etc., will be well understood from the halftone. A number of samples of automatic lathe work are illustrated in Fig. 5. The two worms, the one resting on the other, may be selected as showing the manufacturing capacity of the tool in very different pieces of work. The large worm is 8 inches in diameter and 8 inches long with 6 inches lead, quadruple thread. This was finished in 90 minutes. The small worm was ½-inch diameter and 1½ inches long with 1½ inches lead, sextuple thread, and this was completed in 6 minutes.

MICROSCOPIC ANALYSIS OF METALS.

The address of Albert Sauveur, of Boston, before the Engineers' Society, of Western Pennsylvania, on the use of the Microscope in the Determination of the Properties of Steel, was reported in synopsis in *The Iron Trade Review* of Nov. 27. In the discussion of the paper a written account was presented by W. J. Beck, of the method followed by the Westinghouse Electric & Mfg. Co. in the preparation of samples for microscopic analysis. Mr. Beck's brief paper and the general discussion are given below.

The principal work done in the microscopic study of metal at the works of the Westinghouse Electric & Mfg. Co. has been with low carbon sheet steel (used for electrical purposes), although some attention has been given to cast iron, cast steel, cold rolled steel, and alloys of babbitt and brasses. In preparing a sample for a photograph, three distinct operations are followed: First—Cutting and shaping of the sample. Second—The polishing and etching of the surface to be photographed. Third—Microscopical examination and photographing.

First—In the case of sheet steel analysis, the sheet of a known heat or lot is selected, and strips of approximately ¼"x1" are cut from the various parts of the sheet, and each is recorded, and at once stamped with a serial number. After having selected several samples, they are taken, one by one, and mounted on a small holder. This holder consists of a block of hardened steel ¼"x½"x½" with perfectly squared sides. Over this is a small frame with internal dimensions ⅛"x¼"x5-16," and provided with small thumb screws for fastening the samples when in position. In forming the sample on the holder, it is first clamped in the vise between the holder, and a second piece of hard steel in order to obtain a smooth surface for polishing. It is then bent down on the sides of the holder forming a U-shaped piece or sample. It is then removed from the vise, and a clamp put on, holding the sample in position with the thumb screws. This gives a perfectly flat surface on top and bottom of the holder, and the sample need not be removed for examination under the microscope during the process of polishing and photographing.

The apparatus used for polishing samples of metal is similar to the apparatus described by Mr. Albert Sauveur, in the *Metallographist* of October, 1901. [This polishing machine consists of four polishing wheels mounted no a horizontal shaft and revolving in a vertical plane. The first wheel is a solid fine grain emery, approximately 8" in diameter. The second is a metal disc covered with coarse canvas coated with an emery paste. The third and fourth are made up of a wood block, the third being covered with a good quality of billiard cloth, and coated with a white paste, consisting principally of tripoli and soap. The fourth is covered with a heavy broadcloth, for which is used a paste made of jeweler's rouge. An average of twenty samples have already been prepared without renewing the cloth on the wheel, which can be done in a very short time.]

Having mounted the sample on the holder, it is not necessary to do any filing on the surface to be polished, there being but a thin coat of oxide on the surface which can be easily removed with the emery wheel, thus giving a more true surface than that obtained by means of a file or by hand on emery cloth. When applying the sample to the emery wheel, care is taken not to hold too long in one position, but to gradually keep changing to avoid cutting deep furrows in the surface. One or two slight touches of the sample on the emery wheel is generally sufficient to remove the scale or oxide. It is then passed to the second wheel, and the heavy scratches removed with the emery paste. The sample is then washed thoroughly and passed to the third wheel. In most cases, and for ordinary examinations of the sample, a sufficiently good surface is obtained from this wheel. If, however, photographs are to be taken, the sample is again thoroughly washed, then applied to the fourth wheel on which a paste made of jeweler's rouge is used with an

abundant supply of water, in order that the rouge does not become hard and scratch the surface.

The method followed in etching a soft steel sample is one in which it is possible to carry on the etching of several samples at one time. Various methods have been tried, but the results as thus far obtained have been with the use of a solution of diluted nitric acid. The strength of this solution is approximately one part nitric acid and twenty parts water. The time required to give a properly etched surface varies from ½ to 3 minutes, depending upon the hardness of the steel.

Third—The apparatus used for the examination and photographing of the samples is a Bausch & Lomb microscope with camera attachment, and fitted with apochromatic objectives with compensated eye pieces and a mechanical stage. The light used is from a d. c. arc lamp, automatically fed, and fitted with condensers and cooling cells, giving parallel rays which are concentrated by bulls eye through a ray filter, and then thrown on the illuminator of the microscope. In the study of the structure of the metal, the image is generally thrown on a screen, which makes it much easier to select the part desired for the photograph, and less tiresome to the eyes. Having selected the section to be photographed, the plate is exposed from one to three seconds, depending upon the surface of the sample, and quantity of light admitted. By the use of the ray filter, much more satisfactory results have been obtained, and it is thought that in this way less expensive objectives may be used with very good results. All photographs are taken at about 80 diameters for convenience in comparison of the structure.

Mr. Hall—I would like to say for the information of the members, that I have examined some brasses, and simply took a piece of sheet brass about ¼-inchx1-inch and turned over the ends, leaving the face on top possibly ¼-inch square. This is very simple and easily done, and furnished quite enough surface to show the structure

Mr. Scott—In the process Mr. Beck describes, is this preparation long and tedious?

Mr. Skinner—The process which Mr. Beck described required a comparatively short time. Simply bending a plate over, as Mr. Hall describes, amounts to the same thing so far as the shape is concerned. In our experiments we deal almost exclusively with steels never above .15 carbon, and in sheets of a thickness not exceeding 1-32 inch in any case. You will see, therefore, that we are working on a special problem which has very narrow limits as to chemical analysis. Professor Sauveur has spoken of the use of metallography in solving our specially difficult problems, and this particular work, which I mention, was instituted for the purpose of trying to solve one which we have not been able to solve, by this or any other method. It is probably known to a considerable number of those present, that steel used in electrical work has the property of "ageing." This was discovered about ten years ago, and electrical engineers have been endeavoring ever since to discover a way to cure it. This "ageing" consists in an increase in the electrical losses in the steel after it has been put in service. These losses are brought down to a minimum by properly annealing before the apparatus is built. and it was thought when this phenomenon was first discovered that it was due to the alternations of the magnetism to which this metal is subjected. It was soon discovered, however, that it was simply a phenomenen of heat, and that a temperature of 100 C. would, in some cases, age a steel 100 percent in ten days. Those of you who are used to thinking of steel as a permanent material may be very much surprised at this statement. We have found that many steels age almost none at all, and that some age very much with no apparent essential difference in the chemical composition or physical construction. We have, therefore, resorted to the microscope, and considerable work has been done in that line. Like many others, however, we have been somewhat disappointed in that, we have not found what makes this diffierence. We have, however, found out a number of things which have been of considerable benefit to the work, and our efforts have, therefore, not been fruitless. In our examinations we have followed the material from the billet to the sheet, through all kinds of annealing, and I have some slides which might possibly be shown later, showing samples not annealed, and samples annealed as much as 25 to 30 times. I had hoped to get these on the screen and have Prof. Sauveur make some comments, and I still hope we may have this later.

Prof. Sauveur—I would like to ask whether you have been able to find any relation between the ageing and the structure of the steel?

Mr. Skinner—No, we have not been able to ascertain any characteristics which seem to be peculiar to steel which has aged. We think we have a clue, however, and that in most cases we can distinguish material which will prove of good quality. This quality, by the way, varies considerably in steels of the same kind as well as in steels of different kinds. As to the cause of the phenomenon of ageing, pure and simple, we have, I am sorry to say, very little clue. In the first place, I may say that it is exceedingly difficult to test a particular piece for ageing and then make microphotographs before and afterwards. A sample for the ageing tests requires about 10 lbs. of the metal, while a sample for microscopic examination requires only a few grains, and it is very difficult to combine the results of the two tests or compare them in such a way as to be able to say this sample did change and this did not. The structure in a single sheet will vary in different parts, due to annealing, etc., and even in low carbon steel we found a very considerable difference.

Prof. Sauveur—It seems to me the best way to handle a question of that kind would be to mark a certain area on your piece of steel, take a photograph of it, then in due time ascertained whether that steel has aged, and by taking another photograph of the same area see if you can find any corresponding change in structure.

Mr. Skinner—I might say that the difficulty there, is the one I hinted at a moment ago, viz., to make measurements showing ageing requires about 10 lbs. of the metal, and we would have to take an average of several thousand photographs to be sure what part of the steel aged.

Mr. Scott—It strikes me there is a good deal of similarity between steel and bread. Different makers of steel may take the same materials and make widely varying mixtures; and we all know that cooks can produce both good and bad combinations from the same simple ingredients.

Mr. Skinner—Mr. Lewis has suggested that I explain that the ageing which occurs in steel is in a considerable mass of these thin plates built up, and we do not know whether it is one or the other or all which have to do with the ageing.

Mr. Tyler—I have been very much interested in the talk this evening, but I have had no practical experience in this line of work. I had hoped, however, for still better results than those we have so far secured. I also hope that we may be able to obtain satisfactory results from a determination of alloys in connection with the brass foundry, but at the present time we have not done very much in this respect. I remember of having an experience a number of years ago with a tool steel in which the trouble was finally found to be due to the tempering process and to lack of drawing the temper after plunging bath.

Mr. Hall—We have examined some babbitt metals which had exactly the same chemical composition, and they looked totally unlike each other under the microscope. One showed a mass of very hard grains with crystals of copper and tin in the shape of six pointed stars. The other showed a large number of white or light colored crystals in comparatively small grain masses. While we have not as yet gone into the subject very deeply, this variation is undoubtedly due to the heat treatment of the two babbitts and possibly one was poured into some form of shell which affected its structure. I simply mention this as corroborating Prof. Sauveur's statement of the effect of heating and cooling metals.

Mr. Swensson—I think the members of the society would be interested in knowing something about the actual temperatures of annealing.

Prof. Sauveur—It is pretty well known that in order to properly anneal a piece of steel, and in order to confer a fine structure upon it, the metal should be heated past the critical point, with which most of you are familiar, that is, the steel is heated to a certain temperature—generally in the neighborhood of 750 C. where it passes the critical point. You may start out with a very coarse structure, and when the metal passes through its critical stage or point, at about 750 C., that structure is destroyed entirely irrespective of its original condition.

(At this point Mr. Albree submitted two samples of steel forgings, which his firm is furnishing for the government, one of which had been annealed, and the other not annealed; both being fractured to show appearance of the grain, and asked Prof. Sauveur's opinion of the two structures. The Professor stated that judging from the appearance to the naked eye, the piece which had been annealed looked the coarser, and suggested that it might have been annealed at too high a temperature; he also remarked that the appearance of the fracture does not always indicate just what the metal is, however.)

Mr. Bole—Supposing that the temperature of annealing has been determined: Does the time in bringing that steel up to that temperature have any important effect; or the time that it is maintained at that temperature; or the time occupied in losing that temperature?

Prof. Sauveur—I think the important point is to heat the whole piece through and through to the desired temperature, and if you are dealing with pieces of large cross section, it would take a certain time to obtain that temperature. After you have once reached the proper temperature, however, I do not think anything is gained by keeping it at that temperature. However, I think the slow cooling is desirable.

Mr. Bole—Would not slow cooling have the effect of making the structure very course? Would it not make the steel rather poor looking?

Prof. Sauveur—The rate of cooling from a high temperature has a marked effect upon the coarseness of the structure. But, if the piece is only heated to the critical point, and cooled down very slowly, the structure does not change, because it is below the critical point. It is above the critical point that the crystaline changes take place. If the metal is heated only to the critical point, or possibly a little above, and cooled, the structure remains the same. But, if you heat it to a very high temperature, the rate of cooling would undoubtedly have a marked influence on the structure.

Mr. Bole—Suppose a piece of steel was heated, and cooled very quickly by plunging in oil.

Prof. Sauveur—That would harden the steel. While the carbon is passing back into the cement condition, it is desirable to give all the time necessary for this process to take place. If you quench it too quickly, you would undoubtedly retain some of the carbon in the hardening conditions.

Mr. Lynch—I would like to ask if the quality of castings, and particularly large ones, could not be improved very much by covering same with sand, and allowing them to cool very gradually. Take a large casting, of say, 50,000 lbs., and it is a very difficult matter to cool it properly, and in the particular case I have in mind, I made a special request to have the casting covered as much as three feet with sand, allowing it to cool entirely before removing. Is not this a very good thing to do with heavy castings?

Prof. Sauveur—If you examined the structure of your casting, you would probably find it of a relatively coarse nature, and therefore, not as ductile as it might be made. By cooling in the method you described, you would undoubtedly relieve the cooling strains very much, and I am not at all surprised that it resulted in an increase of ductility.

STEEL FOUNDRIES IN THE UNITED STATES AND CANADA.

The manufacture of steel castings has increased at a very rapid rate within recent years and the limits within which it is economical to use this class of castings have constantly widened. Methods of molding have been improved and the metallurgical side of this branch of the foundry trade has received its full share of attention with the result that quality has been improved and the cost of making steel castings reduced. We append a list of the plants engaged in turning out steel castings at the present time and the process employed, together with their annual capacity. The data on which this statement is based were obtained in nearly all cases from original sources. In some instances, owing to the absence of direct information concerning capacity, we have been compelled to estimate the possible production of several plants, and where this is the case the figures relating thereto appear with an asterisk (*).

ALABAMA.

Tennessee Coal, Iron & Railroad Co., Ensley, Ala. Basic open-hearth. 10,000 tons.*

CALIFORNIA.

Union Iron Works, San Francisco, Cal. Tropenas. 300 tons. Output consumed by company.

COLORADO.

Colorado Fuel & Iron Co., Pueblo, Colo. Bessemer. Makes castings for own use only.

CONNECTICUT.

Maleable Iron Fittings Co., Branford, Conn. Acid open-hearth. 4,000 tons.

ILLINOIS.

American Steel Foundries, (Sargent plant), Chicago, Ill. Crucible. 600 tons. Acid open-hearth. 7,500 tons.*

American Brake Shoe & Foundry Co., Chicago Heights, Ill. Tropenas. 3,000 tons.

American Steel Foundries, (Leighton & Howard plant), East St. Louis, Ill. Basic open-hearth. 20,000 tons.*

American Steel Foundries, (Granite City plant), Granite City, Ill. Basic open-hearth. 20,000 tons.*

Commonwealth Steel Co., Granite City, Ill. Basic open-hearth. 75,000 tons.

Illinois Steel Co., Joliet, Ill. Bessemer. Makes no castings for the general market.

Latrobe Steel & Coupler Co., Melrose Park, Ill. Acid open-hearth. 30,000 tons.

INDIANA.

Gould Steel Co., Anderson, Ind. Acid open-hearth. 5,000 tons.

National Car Coupler Co., Converse, Ind. Acid open-hearth. 8,000 tons.

Matthews Steel Casting Co., Matthews, Ind. Acid open-hearth. 8,000 tons.

National Steel Casting Co., Montpelier, Ind. Acid open-hearth. 3,500 tons.

Whiteley Steel Co., Muncie, Ind. Special process. 1,500 tons.

Peru Steel Casting Co., Peru, Ind. Basic open-hearth. 18,000 tons.

MASSACHUSETTS.

Tool Steel Casting Co., Chelsea, Mass. (Office Boston). Crucible. 500 tons.*

United States Steel Co., West Everett, Mass. Crucible and acid open-hearth. Crucible, 2,000 tons. Acid open-hearth, 10,000 tons.

General Electric Co., Lynn, Mass. Acid open-hearth. 10,000 tons.

MICHIGAN.

Detroit Steel Casting Co., Detroit, Mich. Robert-Bessemer. 5,000 tons.*

MINNESOTA.

American Hoist & Derrick Co., St. Paul, Minn. Tropenas. All castings consumed by company.

MISSOURI.

Scullin-Gallagher Iron & Steel Co., St. Louis, Mo. Acid and basic open-hearth. 20,000 tons.*

NEW JERSEY.

Uniform Steel Co., Rahway, N. J. Crucible. 3,000 tons.

Graphite Metal Co., Garwood, N. J. Special process. 800 tons.

Taylor Iron & Steel Co., High Bridge, N. J. Hadfield special process. 10,000 tons.

Benjamin Atha & Co., Newark, N. J. Acid and basic open-hearth. 15,000 tons.

NEW YORK.

Chrome Steel Works, Brooklyn, N. Y. Crucible. 3,000 tons.

Pratt & Letchworth Co., Buffalo, N. Y. Acid open-hearth. 7,500 tons.

John Drew Steel Foundry, Lockport, N. Y. Special crucible. 1,000 tons.*

Isaac G. Johnson Co., Spuyten Duyvil, N. Y. Crucible and acid open-hearth. 7,500 tons.

OHIO.

American Steel Foundries, (Alliance Works), Alliance, O. Acid open-hearth. 20,000 tons.*

Canton Saw Co., Canton, O. Crucible. Small output, largely for company's use.

Cleveland Steel Casting Co., Cleveland, O. Acid, open-hearth. 30,000 tons.

Otis Steel Co., Cleveland, O. Acid and basic- open-hearth. 10,000 tons.

Wellman-Seaver-Morgan Engineering Co., Cleveland, O. Basic open-hearth. 6,000 tons.

Buckeye Malleable Iron & Coupler Co., Columbus, O. Acid and basic open-hearth. 45,000 tons.

Marion Steam Shovel Co., Marion, Ohio. Robert-Bessemer. 3,000 tons. Greater part of output consumed in company's works.

Coxey Steel & Silica Sand Co., Mt. Vernon, Ohio. Acid open-hearthed. 18,000 tons.

Newark Iron & Steel Co., Newark, O. Acid open-hearth. 3,000 tons.

United Engineering & Foundry Co. (Lloyd Booth Co., Dept.) Youngstown, Ohio. Acid open-hearth. 6,000 tons.

Youngstown Steel Casting Co., Youngstown, O. Acid open-hearth. 3,000 tons.

PENNSYLVANIA.

Diamond Drill & Machine Co., Birdsboro, Pa. Acid open-hearth. 5,000 tons. Expect to double capacity during 1903.

Sterling Steel Foundry Co., Braddock, Pa. Acid open-hearth. 30,000 tons.

Standard Steel Works, Burnham, Pa. Acid open-hearth. 6,000 tons. Output principally consumed by company's works.

American Steel Foundries, (Chester plant), Chester, Pa. Acid open-hearth. 25,000 tons.*

Chester Steel Casting Co., Chester, Pa. Acid open-hearth. 10,000 tons.*

Penn Steel Casting & Machine Co., Chester, Pa. Acid open-hearth. 12,000 tons.*

Seaboard Steel Casting Co., Chester, Pa. Acid open-hearth. 20,000 tons.

Solid Steel Casting Co., Chester, Pa. Acid open-hearth. 9,000 tons.

Lukens Iron & Steel Co., Coatesville, Pa. Acid open-hearth. Makes castings for own use only.

Duquesne Steel Foundry Co., Coraopolis, Pa. (Office, Pittsburg). Acid open-hearth. 12,000 tons.

American Steel Foundries, (Franklin Works), Franklin, Pa. Acid open-hearth. 10,000 tons.*

Pittsburg Steel Foundry, Glassport, Pa. (Office, Pittsburg). Acid and basic open-hearth. 25,000 tons.

Carnegie Steel Co., Homestead, Pa. Open-hearth. Makes castings for its own use only.

Mesta Machine Co., Homestead, Pa. (Office, Pittsburg). Acid open-hearth. 10,000 tons.

Lorain Steel Co., Johnstown, Pa. Acid open-hearth. 7,000 tons.

Carbon Steel Casting Co., Lancaster, Pa. Special process. 1,000 tons.

Midvale Steel Co., Philadelphia. Basic open-hearth. 3,000 tons.*

Philadelphia Steel & Iron Co., (Frankford), Philadelphia, Pa. Special process. 500 tons. Expect to build Bessemer plant in near future.

Stanley G. Flagg & Co., Philadelphia, Pa. Special process. 500 tons.

Wm. Wharton, Jr., & Co., Philadelphia, Pa. Tropenas. 2,000 tons. Output consumed by company.

Phoenix Iron Works, Phoenixville, Pa. Acid open-hearth. 2,500 tons.* Output consumed by company.

Jones & Laughlin Steel Co., Pittsburg. Acid open-hearth. Castings for its own use only.

McConway & Torley Co., Pittsburg, Pa. Acid open-hearth. 15,000 tons.

Mackintosh, Hemphill & Co., (Fort Pitt Foundry). Acid open-hearth. 2,500 tons.

American Steel Foundries, (Reliance plant), Pittsburg, Pa. Crucible and acid open-hearth. 3,000 tons.*

Union Steel Casting Co., Pittsburg, Pa. Acid open-hearth. 7,000 tons.

Brylgon Steel Casting Co., Reading, Pa. Bessemer. 2,500 tons.

American Steel Foundries, (Sharon plant), Sharon, Pa. Acid open-hearth. 25,000 tons.*

National Malleable Castings Co., Sharon, Pa. Acid open-hearth. 18,000 tons.*

Bethlehem Steel Co., Bethlehem, Pa. Crucible and acid open-hearth. 15,000 tons.*

Pennsylvania Steel Co., Steelton, Pa. Acid open-hearth. 15,000 tons.

Norway Iron & Steel Co., York, Pa. Acid open-hearth. 3,000 tons.

TENNESSEE.

John Leighton & Sons, Chattanooga, Tenn. Small output of crucible steel castings.

WISCONSIN.

Clinton Burnham Foundry Co., Milwaukee, Wis. Crucible. 300 tons.

Crucible Steel Castings Co., Milwaukee, Wis. Crucible. 650 tons.

J. A. & P. E. Dutcher Co., Milwaukee, Wis. Crucible and acid open-hearth. 1,000 tons.*

Falk Co., Milwaukee, Wis. Acid open-hearth. 12,000 tons.

Bay View Steel Casting Co., Milwaukee, Wis. Crucible and acid open-hearth. 900 tons.*

Geo. H. Smith Steel Casting Co., Milwaukee, Wis. Bessemer. 3,000 tons.

Nortmann & Duffke Foundry Co., Milwaukee, Wis. Crucible. 1,000 tons.

Shaw-Gerlinger Steel Casting Co., West Allis, (Milwaukee) Wis. Crucible. 450 tons.

CANADA.

Wm. Kennedy & Sons, Owen Sound, Ont. Tropenas. 500 tons.

Canada Switch & Spring Co., Montreal, P. Q. Acid open-hearth. 5,000 tons.

Summary.

Arranging the above information according to states, and omitting the capacity of eight plants making castings for their own use only, we have the following figures:

State.	No. of Steel Foundries.	Annual Capacity.
Alabama	1	10,000
California	1	300
Colorado	1	.....
Connecticut	1	4,000
Illinois	7	156,100
Indiana	6	44,000
Massachusetts	3	22,500
Michigan	1	5,000
Minnesota	1	.....
Missouri	1	20,000
New Jersey	4	28,500
New York	4	19,000
Ohio	11	144,000
Pennsylvania	32	296,500
Tennessee	1	.....
Wisconsin	8	19,300
Canada	2	5,500

The total number of plants making steel castings is 85, of which 77 claim a capacity of 774,700 tons per annum. The word capacity as here used is very elastic in its application and has only a remote connection with the actual output of the plants. In nearly every instance the figures quoted represent

the melting capacity, just as a gray iron foundry may be able to melt 200 tons or iron at a time and yet not have an output exceeding 40 tons of castings per day. It is evident that it would be difficult for many of these plants to reach their "full capacity" if this had to be poured into the average run of steel castings. With the capacity claimed there would seem to be but little need of the erection of additional works, and yet buyers of steel castings are complaining of delayed deliveries, which would indicate that a lack of molding space rather than melting capacity is responsible for this condition. A few of the steel foundries also make special ingots, which of course should not be included under the head of castings, although made in sand molds; at the same time, as is well known, it is difficult for a foundry to divide its tonnage.

In this connection it is interesting to note the report made to the Census Bureau of 1900 by Wm. G. Gray, special expert. Mr. Gray found the output of steel castings that year to have been 177,156 gross tons, of which open-hearth led with 165,529; Bessemer, 3,761, and crucible and special processes, 7,866. There were 44 establishments making open-hearth castings in 1900, while our figures show 57 at the beginning of 1903, a net gain of 13. Mr. Gray gives the average value per ton of steel castings in 1900 as being $81.43 in Pennsylvania, $67.95 in Illinois, and $77.93 in Ohio. The value of crucible steel castings per ton in the same year is given as $150.85 for Wisconsin, $148.30 for Pennsylvania and $135.13 for Illinois. The total value of all steel castings produced in 1900 is $14,609,893.

With the extensive additions that have been made to older plants and the rapid increase in the number of new works which has taken place in recent years, the annual output of steel castings should at a conservative estimate soon reach 350,000 tons. It may be mentioned that of the 57 foundries making open-hearth steel castings at the present time, eight, with an estimated capacity of 130,500 tons, are owned by one company. Accepting these figures as nearly correct the leading concern in this industry controls about 18 percent of the trade.

The open-hearth process is employed by 57 foundries, the Bessemer process, or modifications of same, by 11 foundries; special processes are used by 7 makers of steel castings and the crucible process exclusively by 10 foundries. In addition to making steel castings by the open-hearth or the Bessemer process, a number of foundries also make crucible castings. Concerns of this class are not included in the figures quoted for this branch of the trade.

In addition to the active concerns listed above the following companies have been organized to make steel castings:

Colorado Steel Casting Co., Colorado Springs, Colo.

Lima Locomotive & Machine Co., Lima, O., contemplates the manufacture of steel castings in its new foundry, which it is expected will be completed within a year.

Norwalk Steel & Iron Co., Norwalk, O., is reported as intending to erect a steel casting plant during 1903.

The Filer & Stowell Co., of Milwaukee, Wis., will include a steel casting department in their new foundry, now under construction. This is to have a 15-ton open-hearth furnace.

Ottawa Steel Casting Co., Ltd., Ottawa, Ontario. Company recently organized and likely to build plant during present year.

The Henry Steel Casting Co., St. Louis, Mo., have recently been incorporated. No details as to the plans of this company are at hand.

Rogers, Brown & Co. have purchased outright the property of the Austin Coal & Coke Co., of Austin, W. Va., consisting of a large acreage of excellent coking coal together with 400 coke ovens. It has been decided to increase the coke output by the erection of 200 additional ovens and work will be commenced shortly. It is believed that the additional ovens will be producing by the first of next year. Rogers, Brown & Co. have been gradually increasing their coke properties, being large stockholders in the Orient Coal & Coke Co., recently organized for the purpose of erecting 400 ovens in the lower Connellsville region. Work has been commenced on 100 ovens, the remainder to be built upon the completion of those under erection.

STEEL CORPORATION ORDERS ARE BONA FIDE.

Concerning the question which has been raised in certain quarters whether some of the orders now on the books of the United States Steel Corporation are speculative, a representative of the corporation has been quoted as saying:

"We announced some time ago that the management of the Steel Corporation was scrutinizing every order very carefully, and in the event of the discovery of the least irregularity it would be discarded. We are still following out this policy, and if our unfilled business represents any speculative orders we are not aware of the fact. Of course, a few may have crept in, but in the aggregate they amount to nothing as compared with the total amount of business already on our books. With the steel corporation selling its products at lower figures than many of the independent mills, it is natural for buyers to seek material from us in order to obtain extreme prices. An illustration of this is found in the fact that steel billets are selling on the same level as steel rails. Not long ago they were commanding a price several dollars above the uniform price of $28 a ton for steel rails.

"The 5,000,000 or 6,000,000 tons of unfilled business on our books represents legitimate orders. That is, the purchasers desire this steel for contracts they have already made with third parties. As is generally known we have sold our entire possible production of steel rails for 1903. People who are in touch with the steel rail situation of the country are well aware that every rail that has been ordered will be taken. In fact, we could sell considerably more steel rails if we were in a position to produce them. As for steel plate, one large company has been compelled to limit its output, owing to its inability to secure sufficient material. The demand, to a large extent, has been accelerated by the rapid growth of the shipbuilding industry. This is the time of the year when building operations are at a standstill, owing to cold weather, but notwithstanding this, the American Bridge Co. is receiving orders representing thousands of tons of material, which call for delivery months ahead.

"This shows that the building movement which gained such headway last year will be continued with as much vigor as ever when warm weather sets in. The increase in building operations is not confined to New York. In every city in the country buildings of brick and mortar are being replaced with modern steel structures. The same statement can be applied to bridges. While the mills that produce light finished products are not sold so far ahead as the plants that turn out heavier material they are all running full time, and no surplus stocks are being accumulated."

Standard Chain Co.'s Report.

President John C. Schmidt, of the Standard Chain Co., presented his report for the past year at the annual stockholders' meeting. Accompanying it was the following financial statement, being the condensed balance sheet for Dec. 31, 1902: Assets—Real estate, plant, buildings and machinery, $2,461,308; new construction, $176,506; common stock in treasury, $10,000; accounts and notes receivable, $261,854; materials and supplies (including furniture and interest and insurance paid in advance), $463,944; cash, $10,376; total, $3,383,989. Liabilities—Capital stock, common, $1,277,200; preferred, $1,031,400; first mortgage bonds issued, $700,000; less redeemed and canceled, $40,000; treasury bonds, $113,000; accounts payable, $132,369; bills payable, $151,000; bond interest accrued (not due), $12,780; total liabilities, $3,151,749; first mortgage bonds, premium account, $6,329; surplus, $225,909; total, $3,383,989.

The following directors were elected to serve for the ensuing year: John C. Schmidt, Charles H. Hayden, Robert Garland, J. T. Davis, A. S. White, Franz Krein, Eli Attwood, Peter Wertz, Frederic F. Culver, Charles A. Painter, George S. Schmidt, F. W. Prentiss and Oscar L. Gubelmann. Out of a possible 22,946 votes, 20,706 were cast for each director above named. At the subsequent directors' meeting the following officers were elected: John C. Schmidt, president; Robert Garland, vice president; J. T. Davis, General manager; Franz Krein, assistant general manager; William Robertson, treasurer, and W. R. Dawson, general sales agent. Executive committee: John C. Schmidt, chairman; Robert Garland, J. T. Davis, Franz Krein and Peter Wertz.

THE WORK OF THE PATENT OFFICE IN 1902.

The report of Commissioner of Patents Allen for the year ending Dec. 31, 1902, shows that there were received last year 48,320 applications for mechanical patents, 1,170 applications for design patents, 151 applications for reissues of patents, 2,602 applications for registration of trade marks, 1,121 applications for registration of labels and 266 applications for registration of prints. There were 27,776 patents issued, including designs, 110 patents reissued, 2,006 trade marks registered, 767 labels, and 158 prints. The number of patents that expired was 23,331. The number of allowed applications awaiting the payment of final fees was 9,284. The number that were forfeited for non-payment of the final fees was 4,471. The total expenditures were $1,393,345.54. The receipts over expenditures were $159,513.54. The total balance to the credit of the Patent Office in the Treasury of the United States on Jan. 1, 1903, was $5,488,984.61.

In proportion to population more patents were issued to citizens of the District of Columbia than to those of any of the States or Territories—one to every 1,080. Next in order are the following: Connecticut, 1 to every 1,240; Massachusetts, 1 to every 1,439; Rhode Island, 1 to every 1,558; New Jersey, 1 to every 1,605; Colorado, 1 to every 1,670; California, 1 to every 1,738; New York, 1 to every 1,764; Illinois, 1 to every 1,906; Pennsylvania, 1 to every 2,257; Ohio, 1 to every 2,271; Washington, 1 to every 2,712; Nevada, 1 to every 2,822; Michigan, 1 to every 3,119; Montana, 1 to every 3,244; Arizona Territory, 1 to every 3,615; Indiana, 1 to every 3,723; Maryland, 1 to every 3,814; Minnesota, 1 to every 3,926; Wisconsin, 1 to every 3,971; Missouri, 1 to every 4,039; Oregon, 1 to every 4,135; Iowa, 1 to every 4,203; Delaware, 1 to every 4,296; New Hampshire, 1 to every 4,378; Vermont, 1 to every 4,840; Nebraska, 1 to every 4,856; North Dakota, 1 to every 4,986; Maine, 1 to every 5,032; Kansas, 1 to every 5,308; Wyoming, 1 to every 6,168; Utah, 1 to every 6,289; Idaho, 1 to every 6,470; South Dakota, 1 to every 6,476; New Mexico Territory, 1 to every 7,812; West Virginia, 1 to every 8,057; Oklahoma Territory, 1 to every 8,296; Texas, 1 to every 8,515; Virginia, 1 to every 9,224; Kentucky, 1 to every 9,255; Florida, 1 every 9,272; Tennessee, 1 to every 10,922; Olaska Territory, 1 to every 12,688. The fewest patents granted in proportion to the number of inhabitants were in the following States and Territories: South Carolina, 1 to every 29,137; Alabama, 1 to every 20,547; North Carolina, 1 to every 19,523; Mississippi, 1 to every 17,046; Arkansas, 1 to every 15,801; Louisiana, 1 to every 15,700; Indian Territory, 1 to every 15,678; Georgia, 1 to every 13,681; Hawaii Territory, 1 to every 12,833.

As to foreign patents, 1,000 were granted to residents of England; 956 to those of Germany; 392 to those of Canada; 346 to those of France; 132 to those of Austria-Hungary; 104 to those of Scotland; 78 to those of Switzerland; 63 to those of Sweden; 50 to those of Russia; 48 to those of New Zealand; 45 to those of Belgium; 39 to those of Italy; 36 to those of Victoria; 31 to those of Denmark; 28 to those of Ireland; 21 to those of New South Wales; 20 to those of Mexico; 17 to those of Norway; 16 to those of the Netherlands; 13 to those of South Australia; 10 to those of Cuba; Argentina, India, and Queensland, 5 each; Egypt and South African Republic, 4 each; Brazil, Cape Colony, China, and Spain, 3 each; Columbia, Japan, Natal, and Western Australia, 2 each; and Bahama Islands, Bermuda, Chile, Cocos Island, Newfoundland, Peru, Portugal, Roumania, Santo Domingo Tasmania, and Uruguay, 1 each.

The Patent Office issued 27,886 patents during the year 1902, the largest annual issue in its entire history.

The Commissioner recommends an increase in the appropriation of $2,000 made for the purchase of books and sending the publications of the Patent Office to foreign governments. This is claimed to be insufficient and the usefulness of the working library for the examiners and the public could be greatly enhanced by an annual increase of $2,000 which is asked by the estimate for 1903-4. The growth of the business of the office and the accumulation of the records are cited as an argument for better facilities and the advantages of more room for the bureau.

A Comparison With the British Patent Office.

The number of applications made during the past year at the British Patent Office is reported at 28,957 or nearly 60 percent of the number of applications for mechanical patents received at the Patent Office in this country. The number of patents shows a marked increase for Great Britain when compared with the two previous years, 1900 and 1901. During these years the totals are reported respectively as 23,924 and 26,777. It is quite likely that the war in South Africa had considerable to do with the condition of the Patent Office during these lean years of invention.

The past year in the experience of the British Patent Office has shown that the trend of invention has been largely toward improvements in electric traction; devices for preventing accidents through rupture of live wires; automobiles and accessories; air ships; bottle sealing devices to meet the requirements of the recent enactment regulating the sale of intoxicants to children; anti-vibration devices for underground traction lines (evidently the result of the elaborate subway work in London).

On this side of the Atlantic the Patent Office has been prolific also in bottle-sealing devices, schemes of all kinds for preventing the refilling of bottles and allowing some unauthorized substitute to be inserted instead of the simon pure liquid intended by the original owner. One of the most interesting of these has been the sealing of a coin in the glass which could be of sufficient value to ensure the destruction of the receptacle when first emptied. The tendency, amounting almost to a craze, for the design of non-refillable bottles does not seem to be effective in the introduction of them into general use and the industry of the inventors might well be directed to other avenues of possible improvement where chances of adoption would be superior. The non-refillable bottle is apparently in the same category with the nut-lock of equal vitality and even more varied forms of uselessness.

A reading of the patents of the year past suggests numerous devices for applications to typewriter and typesetting mechanism; calculating machines of the cash register and kindred types; coherers, selective devices and other improvements in wireless communication—both telephonic and telegraphic; the car inventions in pressed steel wheels, pressed axles and other contribution of the hydraulic press to the aid of transportation facilities, and these have been accompanied by many improvements of a less radical character inspired doubtless by the common interest in the freight car famine and its general influence on trade; the automobile furor has kept up the quota of inventions in various parts of that industry, steam generators and condensers, a series of steering posts, levers and connections of many kinds, electric motors, storage batteries (long promised but slowly maturing improvements in these last), electric charging devices, explosive engines (mainly of gasoline fed types) and various fittings, igniters, valves, etc. How many of these inventions must of necessity fail to do more than supply grist for the patent attorney and the government office? Very often they lie in the path of some meritorious improvement and form the hidden danger which the conscientious attorney must unearth for the benefit of his client and often to mutual chagrin. The inventive faculty developed by working out an invention and following it later through its passage past the rocks of the office examiners; when successful in this progress, to the final reduction to commercial form and service, is a training of great value even if beset by many annoyances.

The Texas senate has passed a bill appropriating $75,000 to make improvements on the blast furnace in the penitentiary at Rush, Texas. The house has not yet acted and may favor making a much larger appropriation, as recommended by a commission which recently inspected the plant.

RUINS OF EARLY BLAST FURNACES.

BY W. O. PLATT.

Scattered among the hills of Western Pennsylvania can be found many interesting ruins of old blast furnaces that once did their share to supply the country with pig iron. Some of them have been torn down to get the stone

SLAB FURNACE ON SANDY CREEK, 9½ MILES SOUTH OF OIL CITY, PA.

that was in them, while others have been left to the elements and to time. While broadly, of course, the furnace included everything necessary to the production of the pig iron from the ore, in the ordinary mind it was the stack that was thought of when the term "furnace" was used, and the ruins of the old stacks that still serve as landmarks are always spoken of as furnaces.

As one stands looking over a heap of tumbled down stone, the remains of what was once a furnace, sees what the surrounding country is, and thinks of its means of communication with other districts, both now and at the time when the furnaces were doing their best work, it is interesting to inquire why such a situation was selected in the first place, when it was no doubt looked on as a profitable venture. It is also interesting to try to trace the chain of events that compelled their being abandoned. Even today the country of which some old furnace is the center is often without inhabitants or cultivation and of little value except as possible oil land. They were all situated in the forests, from which they drew their supply of wood for charcoal, and while the ore was found in the surrounding hills, the limestone often had to be hauled for many miles.

Valley furnace, which is the only one that I know of that was situated on the west side of the Allegheny river, was on Sugar Creek. It was about six miles from Franklin, in the midst of one of the earliest settled and richest farming sections to be found in Western Pennsylvania. It was round and well built of very fine, large cut stone. Increased cost of labor after the war of the rebellion, and a railroad up the Allegheny Valley seem to have been too much for it. The halftone tells its present appearance.

All of these early furnaces did more or less foundry work, using the iron direct from the stack at a certain part of the run. Probably named after the article that was most frequently wanted, this iron was known as "pot metal" and when a "chopper" bought an ax that did not meet his expectations his term of contempt for it was that it was "nothing but pot metal." Among the old housewives you can still hear it said that these early utensils possessed virtues not found in those made today. It was said that they did not rust after being once used, that they did not taste in the food, that the food cooked easier in them, that they were harder to break, that meat would not burn to them as readily as to the ordinary kind, that they did not crack like the other kind if water was poured into them when they were hot; and not the least in the eyes of the thrifty housewife, they were easy to keep clean and sweet. With all this array of virtues (whether real or imaginary), it is easy to think that it took more than ordinary competition to displace them.

Horse Creek furnace, which was sometimes called Plumer's furnace, was built on the banks of the beautiful Allegheny River and was noted for the fine quality of its iron. It did not have any close home market but was easy to reach from the river cities. Besides the service given by an occasional river steamer that made a trip when the water was right, it was not expensive to float a boat down with a team in it and then have the team tow the loaded boat back. In this way distances were reached that would have been impossible by land. This furnace was built of cut stone, and what remains of it serves as an ornament on the grounds of the Oil City Boat Club.

Van Buren Furnace was of another type. Situated in a lonely hollow, "miles from anyhwere," it seems to be one of the oldest and also one of the first to be abandoned. The cinder beds show that a lot of iron was made there at some time. This iron would have to be hauled several miles to reach the river. Although this furnace is built of poor, rough stones of all sizes, it is in a better state of preservation than any I have seen; perhaps for the reason that the stone in it is not worth hauling away.

Another old furnace, and one evidently born of the necessities of the surrounding community, was Slab furnace. A glance at its picture will show that it was a roughly constructed affair. The country in the immediate vicinity is wild and rough enough today to please anyone, and teamsters all dread Slab furnace hill, but up on the

VAN BUREN FURNACE IN DEEP HOLLOW, 6 MILES SOUTHWEST OF OIL CITY, PA.

upper level is thickly settled farming country. This furnace was one of the last, if not the last, to give up to the struggle against the tide of changed conditions. When one man or set of men got discouraged and gave it up, another set would try it, until finally it got to the place

where the most hopeful saw it was useless to keep on and about 28 years ago the last heat was run.

Nothing remains of Clinton furnace but a pile of unsightly stones and the immense piles of cinders and slag, now overgrown with grass, that show it was once very extensively worked. It had a rich farming country, that was isolated from the rest of the world, for a market. To reach water transportation a long haul was necessary, it being eight miles to the Allegheny river and 14 to the Clarion.

The fuel for all of these furnaces was charcoal, and the

HORSE CREEK FURNACE ON THE ALLEGHENY, 3 MILES FROM OIL CITY, PA.

little level circular clearings where the charcoal "pit" was located, can still be found, grass covered and free from trees.

When iron got below $30 a ton the most favorably situated of these furnaces could not produce it at a profit, although some of them tried it for a time, believing that it was bound to go up; just as we have men who dream of $5 oil today.

A list of all the furnaces would be a long one. Some were named after the Presidents, as Buchanan, Jefferson,

VALLEY FURNACE IN SUGAR CREEK VALLEY, NEAR COOPERSTOWN, 14 MILES WEST OF OIL CITY, PA.

Monroe, and Van Buren. Some were known by their owners' names, as Shippen's, Black's, and Keating's. The names Lucinda, Mary Ann, Lucy, and Sarah, tell their own story. It may not be as easy to see the reason for Prospect, Slab, President, and Buttermilk.

What are left of these old furnaces stand as monuments to the men who dug out homes in the wilderness and labored to make the best of the surroundings. They also stand as silent witnesses of the progress of events, and of the irresistible force of improvements, and surely indicate that the good of the whole country overrides all local considerations sooner or later. The old "iron masters" were great men in the community in their day, but when their work ceased to be economically right it had to give way to that which was, just as later processes will in their turn give way.

Enough of the blowing engine was left at the President furnace the first time that I saw it to show that the cylinder was made of wood with a wooden piston head, the packing seemingly having been made with leather. The driving was by water power furnished by a waterwheel.

With the passing of these old furnaces, the "choppers" that thought more of their axes than they did of anything else in the world, unless it was their families (and many people professed to believe that the family came second), have passed away. With them have gone the charcoal burners, the ore miners and the men who drove the six-mule teams, and made the hills echo with the crack of their whips and with their yells that were vigorous if not always elegant, as well as those workers that were employed at the furnace itself.

No Sympathetic Strikes.

Clauses prohibiting the sympathetic strike will be a feature of this year's agreements between the various contractors' councils and the building trades' unions of Chicago, and, as a result apparently the sympathetic strike in the building lines in that city is dead. This was assured when the architectural iron workers' union and the bricklayers' and masons' union last Saturday signed agreements with the Employers' association, in which it was agreed that neither party will tolerate or recognize any rights of any other association, union, council or body of men not directly interested in the controversy and that they will use all lawful means to compel their members to comply with the arbitration agreement and working rules as jointly agreed upon and adopted. The agreement will go into effect April 1 for three years. All other trades in the building lines are expected to make similar agreements barring the sympathetic strike.

OLD CLINTON FURNACE, ON HEMLOCK CREEK, 15 MILES NORTHEAST OF OIL CITY, PA.

Charles D. Palmeter, superintendent of the Watertown Steam Engine Co., one of the experts who examined the digester in the mill of the Dexter Sulphite Pulp & Paper Co., at Dexter, N. Y., which exploded on the morning of Jan. 18, sent a portion of the steel forming the outer covering to the Hartford Insurance Co. to be tested. The test indicated that the steel would stand a test of 57,000 pounds to the square inch. In his verdict the coroner declared that the explosion was due to the rapid expansion of the brick lining of the digester, which was not met by an equal degree of expansion in the outer or steel covering. The unequal expansion, he said, was due to the rapid heating of the digester. The temperature of the room was below that at which it is ordinarily maintained.

CANADIAN PIG IRON PRODUCTION IN 1902.

The current *Bulletin* of the American Iron and Steel Association presents statistics of the production of pig iron in Canada in 1902, as given below, also data from correspondents of the association concerning the operations of the various iron and steel companies in Canada. The figures show an increase of 74,581 gross tons or over 30 percent as compared with 1901.

The total production in 1902 amounted to 319,557 gross tons, against 244,976 tons in 1901 and 86,090 tons in 1900. In the first half of 1902 the production was 157,804 tons and in the second half it was 161,753 tons, a gain of only 3,949 tons. Of the total production in 1902, 302,712 tons were made with coke and 16,845 tons with charcoal. A little over one-third of the total production was basic pig iron, namely, 107,315 tons. The Bessemer iron made amounted to about 9,000 tons. Spiegeleisen and ferromanganese have not been made since 1899.

The following table gives the total production of all kinds of pig iron (including spiegeleisen and ferromanganese) in Canada from 1894 to 1902. Prior to 1894 the statistics of pig iron production in Canada were not collected by this Association.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1894	44,791	1897	53,796	1900	86,090
1895	37,829	1898	68,755	1901	244,976
1896	60,030	1899	94,077	1902	319,557

On Dec. 31, 1902, the unsold stocks of pig iron in Canada amounted to about 20,000 gross tons, as compared with 59,472 tons at the close of 1901 and 12,465 tons at the close of 1900. Of the unsold pig iron on hand on Dec. 31 over 19,000 tons were coke pig iron.

On Dec. 31, 1902, Canada had 14 completed blast furnaces, of which 7 were in blast and 7 were idle. Of this total 9 were equipped to use coke for fuel, 4 to use charcoal, and 1 to use mixed charcoal and coke. In addition 4 coke and 2 charcoal furnaces were being built or were partly erected on Dec. 31, but work on several of the furnaces was temporarily suspended.

The Cramp Steel Co., Ltd., has put in the foundations for a blast furnace at Collingwood, Simcoe county, Ont. Work upon the furnace was temporarily suspended a short time ago, but it is to be resumed early in the spring. The company expects to have the furnace ready for operation next fall. Coke will be used. Its daily capacity will be about 250 gross tons. The company is now erecting a rolling mill at Collingwood, to be equipped with one 10 and one 18-inch train of rolls, which it expects to have completed early in March. Two 18-ton open-hearth steel furnaces will be connected with the mill.

The Nova Scotia Steel & Coal Co., Ltd., of New Glasgow, Nova Scotia, broke ground in June, 1902, for a new furnace at Sydney Mines, Cape Breton, Nova Scotia. The furnace will be 85 by 17 feet and will have a daily capacity of about 200 tons of basic and foundry pig iron. Coke will be used and red and brown hematite ore will be obtained from Nova Scotia and Newfoundland. The furnace will be equipped with four Roberts hot-blast stoves. It will probably be completed in September. The company now has a furnace at Ferrona, Nova Scotia, with an annual capacity of 33,000 gross tons. It ran for 44 weeks in 1902 and was active on Dec. 31.

The Londonderry Iron & Mining Co., Ltd., of Londonderry, Nova Scotia, is rebuilding Furnace A, at Acadia Iron Mines, and will blow it in in May. The stack will be 75 by 17 feet and will have an annual capacity of 48,000 tons of foundry iron. The company does not contemplate blowing in Furnace B in the near future, but may rebuild it later on.

The Bridgeville Furnace, at Bridgeville, Pictou county, Nova Scotia, was idle during the whole of 1902. The furnace was last active in 1899, when mixed coke and charcoal were used for fuel and pig iron, spiegeleisen, and ferromanganese were made. It is not likely to resume work in the near future.

The Algoma Steel Co., Ltd., of Sault Ste. Marie, Ont., had not completed on Dec. 31, 1902, the erection of the two furnaces which it began building over a year ago. They will have a total annual capacity of about 100,000 tons. One will use coke and the other charcoal.

The Dominion Iron & Steel Co., Ltd., of Sydney, Nova Scotia, had two of its four furnaces in blast on Dec. 31. The two idle furnaces will not resume until a sufficient supply of coke can be assured. In 1902 the company made basic and foundry pig iron.

The Canada Iron Furnace Co., Ltd., had its charcoal furnace at Radnor Forges, Que., out of blast for relining on Dec. 31. It rseumed work on Jan. 20. The furnace ran for 38 weeks last year.

At Trenton, N. J., Justice Van Syckle has filed a written opinion of the Court of Errors and Appeals in the United States Steel Corporation case decided a short time ago. The opinion is in the case of the suit brought by J. Aspinwall Hodge, who sought to restrain the corporation from converting $200,000,000 of preferred stock into bonds. The decision was in the corporation's favor. The opinion holds that the directors have the right to vote at stockholders' meetings to the extent of their stock holdings. The opinion further states that it is a well-established rule that directors of corporations can not legally enter into contracts where they will be specially benefited without the knowledge or consent of stockholders. This knowledge and consent existed in the case at hand. The opinion also says that when the by-laws of a corporation adopted in pursuance of authority conferred by the State provide that a majority vote by the stockholders' meeting shall be binding on a corporation every stockholder is bound by the results of such meeting.

The Allis-Chalmers Co., will remove its general offices on May 1 from the Home Insurance Bldg. to the New York Life Bldg., corner of Monroe and La Salle Sts., Chicago. The company for the past two years has been expending large sums in betterments at the various plants at Milwaukee, Chicago and Scranton. The new offices of the company, in line with this expansion, will provide ample space for the various sales departments and general business offices which will insure the best service. In the past two months orders for either engines, mining machinery, rock crushing machinery, saw mill machinery, or flour mill machinery were booked from every state in the Union, besides England, South Africa, Mexico, Canada, Chile, Central America, Brazil, West Australia, Turkey, Finland, Yukon Territory, Belgium, British Columbia, Bolivia, Hawaiian Islands, Peru, Alaska, China, Philippine Islands.

The Ingersoll-Sargeant Drill Co., Ltd., New York, is offering for subscription in London an issue of £250,000 5 percent debenture stock. The capital is being borrowed to provide for a new property acquired by the American corporation, of which the London company owns the stock. An auditor's report shows that the profits of the American company have averaged $310,000 per year for the past five years, and the prospectus states that the total assets upon which the new debenture stock will be secured are valued at about $4,275,000. The London company has an authorized capital of £4,000,000, of which there have been issued £150,000 preferred and £250,000 ordinary or common shares, of the par value of £1 each.

Six new directors were elected at the first annual meeting of the Chicago Pneumatic Tool Co. which was held in Jersey City Feb. 19: William Chalmers, C. H. Wacker, W. O. Duntley, Joseph Boyer, E. B. Milliken and J. C. Taite, of London. Mr. Chalmers is associated with the Allis-Chalmers Co., and Mr. Taite with the Taite-Howard Co., a concern which was merged into the English branch of the Chicago company.

The report of the Warwick Iron & Steel Co., Philadelphia, for the year ending Dec. 31, 1902, shows net earnings of $61,524.

INJUNCTION AGAINST ELMIRA MACHINISTS.

In the case brought by the Payne Co., of Elmira, N. Y., against its striking machinists and other employes, an injunction was granted on Feb. 14, by Walter Lloyd Smith, justice of the Supreme Court of Chemung County. The petition of the company recited acts of intimidation and violence, several workmen in the shops receiving bodily injuries at the hands of the picketing force of strikers. The strike occurred on Jan. 17, 1903, over the introduction of the individual premium system, as heretofore detailed in these columns. The order of the court requires the defendants to answer within 20 days from Feb. 14. It is as follows:

"Upon reading the summons and complaint in this action, the complaint being verified February 14, 1893, and the affidavits of Horace K. Hathaway, E. Hildebrant, A. A. Rinker, F. P. Jay, F. A. Keis, Eugene Kies, A. M. Ennis, A. Dauch, B. Kern, G. L. Smith, A. Ward, G. Benson, C. J. Holland, Charles B. Swain, Walter Ketley and others, Nathan B. Payne, Benjamin N. Payne and Erwin J. Baldwin, each of said affidavits being verified Feb. 14, 1903; it appearing therefrom to my satisfaction that the plaintiff demands and is entitled to a judgment against the defendants restraining the commission and continuance of the acts hereinafter enjoined, as violations of the plaintiff's personal and property rights, as mentioned and described in the complaint herein, and that the commission or continuance of such acts during the pendency of this action would produce injury to the plaintiff for which it has no adequate remedy at law; and the plaintiff having given an undertaking as required by law; and it appearing that this is a case where the right to an injunction order depends upon the nature of the action;

"It is ordered, that the defendants and each and every one thereof, and all persons acting and combining with them and each and every other person whomsoever known or unknown be, during the pendency of this action and until the further order of the Court enjoined and restrained and commanded absolutely to desist and refrain from in any manner or way interfering with the employes of the plaintiff now in its employ, and from in any manner interfering with any person who may desire to enter the employ of the plaintiff by means of threats, intimidation, espionage, picketing, personal violence, the calling or applying of the names 'scab,' 'pimp,' 'pup,' or any other indecent, insulting or opprobrious name or epithet, or by any other means whatsoever calculated or intended to compel, prevent or force any person from entering or continuing in the employment of the plaintiff, or calculated or intended to induce through fear, apprehension or loss of social standing or injury to property or peace, any person from entering or continuing in the employment of the plaintiff, or calculated or intended to induce any such persons to leave the employment of the plaintiff; by threats, intimidations, coercive manner, physical or otherwise, from interfering with, intimidating, molesting, or threatening in any manner any person or persons with the purpose or intent of inducing such person or persons not to deal with or do business with plaintiff; or congregating or loitering about or near the neighborhood of the plaintiff's said shops or the home of any of its employes, or in any other places with the intent to interfere by threats, force, moral or physical coercion or the application or calling of vile, opprobrious or disagreeable names or epithet, with those who may at any time be the employes of the plaintiff, or who may desire at any time to become employes of the plaintiff or do any business of any kind or description with the plaintiff, or interfere with the prosecution of plaintiff's business; from picketing or patroling the said shops or other premises of the plaintiff, or the homes and stopping places of its employes, or the approaches or entrances thereto, or loitering in or about any of the places named or making loud or boisterous noises in the vicinity thereof, for the purpose of intimidating, or such interference as aforesaid, with the plaintiff's officers or employes or those who desire to become plaintiff's employes or to do business of any kind with it; from interfering in any manner aforesaid with the free access of all persons, employes or others, to plaintiff's premises or places of work, and the free and unmolested passage of such employes to and from their places of business or homes, or interfering by any act expressing or implying a threat, intimidation or force or causing annoyance in any manner implying force and intimidation or threats to the employes of plaintiff; from giving directions or orders to any person or persons, committees or bodies for the performance of any such act or threat hereby enjoined.

"The grounds upon which this injunction order is granted are that the plaintiff's business has been and will be interfered with by the acts of the defendants of the character hereinbefore enjoined and restrained, and that the defendants have committed and are threatening to continue doings and acts of the character hereinbefore enjoined, which acts are unlawful and injurious and damaging to the plaintiff, for which grievances it has no adequate remedy at law."

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New Buyers in the Market and Some of their Wants :—

The Horseshoe Planting & Mfg. Co., with capital of $150,000 has been incorporated at Tchula, Miss.

The Featherstone Foundry & Machine Co., Chicago, has increased its capital from $200,000 to $250,000.

The Independent Machinery Co., Chicago, has been incorporated; capital, $2,500; general manufacturing; incorporators, Julian T. Mack, A. J. Pflaum, and Elias Mayer.

The Jennet Bridge & Iron Works, Chicago, has been incorporated; capital, $10,000; manufacturing structural iron; incorporators, Peter Jennet, M. F. Carr, and Jesse Baldwin.

The capital stock of the Marinette (Wis.) Iron Works Mfg. Co. is to be increased from $200,000 to $400,000. Additional machinery is to be installed.

At the annual meeting of the Record Foundry & Machine Co., of Moncton, N. B., a resolution was passed authorizing an increase of capital stock to $1,000,000 in order to enlarge the plant and output.

The New Century Machine Co., San Francisco, has been incorporated with a capital of $10,000, with Charles L. White, Charles H. Weller, of San Francisco, Charles S. Chamberlain, Charles Finn, of Berkeley, and Jesse Wendell, of Oakland, as directors.

The Southern Automatic Machine Co., Atlanta, Ga., capitalized at $60,000, has been incorporated by Edw. S. Munford and Chas. S. Conklin.

The Richardson-Oliver Co., Kittery, Maine, has been incorporated for the making and sale of screws of all kinds. Capital, $10,000. President, C. C. Smith, Kittery; treasurer, R. H. Back, Athol, Mass.

The Zeno Iron Co., Duluth, Minn., capital stock, $250,000, has been incorporated by Thomas J. and David David, H. J. Granius, W. H. Lawson and C. M. Van Norman, all of Duluth.

The Island Valley Coal & Iron Co., of Linton, Ind., has increased its capital stock from $10,000 to $40,000.

General Pneumatic Tool Co., Montour Falls, N. Y., has been incorporated; capital, $75,000. Directors, R. T. Turner, J. F. Carrier, and Seymour Dexter, Elmira, N. Y.

The Standard Engine Co., of Hartford, Conn., has asked the legislature to amend its franchise so that the capital stock may be increased from $2,000,000 to $5,000,000. The company has not yet established a plant. It now contemplates the manufacture of gas engines.

The Bowen & Steel Equipment Co., Norfolk, Va., recently incorporated, will buy and sell railway equipment and rebuild it at its shops at Suffolk, Va.

N. P. Moss, Lafayette, La., will want boilers, engines, electric plant, etc.

Rivers Furniture Co., 624-34 West Pratt street, Baltimore,

Md., wants 100-horsepower engine, high speed, and three 60-horsepower boilers.

R. B. Carver, chief engineer United States Coal & Mining Co., 303 New England Bldg., Kansas City, Mo., will contract for hoisting engines, boilers, cages, pit cars, blacksmith outfits, buildings, tipples, etc.

Morris Bros., Concord, N. C., want steel beams, heating plant, electric wire, gas pipes, tin roofing, plate glass, paints, oils, pressed brick, granite, lavatory fixtures, etc.

The Windsor Machine Co., Reading Pa., has been incorporated with a capital of $15,000.

The capital stock of the Richford Foundry Co., Richford, Vt., has been increased to $20,000 and the new stock ($10,000) has been taken by the stockholders.

Oregon Foundry & Machine Co., Oregon, Ill., has been incorporated, capital, $30,000; general foundry and manufacturing business. Incorporators, Frederick G. Jones, Asa Dimon, Charles D. Entyre

The capital stock of the C. C. Wormer Machinery Co., Detroit, has been increased from $15,000 to $100,000.

The Montgomery Mfg. & Trading Co., of Montgomery, N. Y., has been incorporated to manufacture canal lock gates, elevators and hoisting machinery. Capital, $250,000, and directors; C. F. Luquer and W. H. Cowan, of Montgomery, and J. F. Stephens, of Highland Falls.

The National Mfg. & Supply Co., Saginaw, Mich., has increased its capital from $50,000 to $150,000. With this increase is announced the purchase of the plant of the Pittsburg Steel Shafting Co., a supply firm of Toledo. The company handled boilers, engines, shafting and transmission goods of all kinds, thus considerably broadening the scope of the field in which the purchasing company has been dealing. In acquiring the business and property of the Toledo concern the National people came into possession of buildings 60x120 and 60x90 feet, aggregating about 50,000 feet of floor space.

National Steam Specialty Co., Chicago, has been incorporated to manufacture brass and iron specialties; capital, $15,000; incorporators, Patrick H. Early, Edmund S. Carr, and K. Early.

The Brown-Corliss Engine Co., Racine, Wis., contemplates increasing its capital from $1,000,000 to $1,200,000.

A company is soon to be incorporated in Dalton, Ga., to manufacture pneumatic springs for use on vehicles. The officers are Paul B. Trammell, of the First National Bank, president; A. B. Mason, of Florence, Ala., vice president; W. S. Sanders, treasurer and manager, and B. L. Sanders, secretary.

Willard F. Smith, Parsons, Kan., manufacturer of brass and iron specialties, will build a new iron foundry the coming spring, and will install a new cupola and other equipment.

Fires and Accidents:—

The shops of the Northwestern Boiler Works at Duluth, Minn., owned by M. A. Ryan, burned Feb. 20. The loss is $100,000, without insurance.

Damage estimated at $200,000 resulted from a fire at the Dominion Iron & Steel Co.'s works, Sydney, B. C., Feb. 19. The coal washing plant was destroyed, and the flames spread to the motive power outfit of the works, consisting of thirteen motors and two engines. All of this property was ruined.

The four-story brick building occupied by John Griffin & Co., Philadelphia, manufacturers of meters, was destroyed by fire Feb. 19; loss $40,000.

New Construction:

The United Steel Casting Co., Los Angeles, Cal., recently incorporated with a capital of $50,000, is about to erect a plant on a site which has just been purchased. The plant will at first consist of three buildings: foundry and machine shop, pattern and carpenter shop, and offices and drafting rooms. The equipment in the foundry will be such as is usual in a steel foundry. The machine shop will be thoroughly equipped with latest style of machines including Brown & Sharpe automatic gear cutting machine—the only one on the coast. The pattern shop will be thoroughly equipped with latest machines of all kinds.

The Toledo Machine & Tool Co., Toledo, O., will erect an additional machine shop, 100x120 feet, two stories.

Thos. Murphy and John McNamee will establish boiler shops at Pekin, Ill. A plant will be built next summer.

Work has been begun on the three story machine shop, 187x100 feet, which will be used by John R. Wiggins & Co., Philadelphia.

The Victor Stove Co., Salem, O., contemplates building an addition and making extensive improvements.

The Sessions Foundry Co., Bristol, Conn., is contemplating the erection of a large addition to its main building in the spring.

A site costing $11,500 has been purchased by the Youngstown Bronze Co., Youngstown, O., upon which will be located the company's new foundry, announcement of which was made in these columns some time ago. The officers of the company are Grant S. Jones, president; W. H. McMillen, secretary and treasurer and W. H. Long, superintendent.

At the annual meeting of the Pennsylvania Engineering Works, of New Castle, Pa., held last week, it was decided to purchase additional property adjoining the plant to make room for further extensions. Officers were elected as follows: Edward King, president and treasurer; Charles Baldwin, secretary and Edward Beadle, general manager. Directors were elected as follows: E. N. Ohl, Edward King, R. C. Patterson, John Reis, George Greer, Edward Beadle and Charles Baldwin.

The Chapinville Wheel Co., Poughkeepsie, N. Y., has not fully completed plans for the buildings which will be erected next summer. In a general way the buildings will be all one story and as near fire proof as it is possible to get such buildings. The company expects to put in a sprinkling system in all buildings. The power plant will be new as well as line shafting and hangers and large part of pulleys.

The American Drill Co., Springfield, O., informs us that reports published in daily newspapers, that it expects to move to Sandusky, O., are without foundation. The company expects to build a plant at Springfield. The following officers were recently elected: President, J. K. Sharick; Vice President A. T. Foster; Secretary James L. Sharick, and Treasurer Allen Thomas.

The Donovan Wire & Iron Co., Toledo, O., recently incorporated, succeeds the Donovan Wire & Iron Works. The new company has purchased seven acres on the main line of the Wheeling & Lake Erie Railway. The buildings are now in the course of erection, and consist of a foundry 200 feet by 65 feet, a structural shop, 200 feet by 70 feet; a pattern shop 30 feet by 65 feet; a pattern safe, 40 feet by 40 feet, and an office 30 feet by 40 feet. The three buildings last mentioned are two-story. The buildings are of brick and steel construction. Modern machinery is being installed and electricity will be the motive power. The company will continue to operate its present plant in the manufacture of light iron work, wire work, bank and office fixtures.

The Union Steel Screen Co., Ltd., Battle Creek, Mich., expects to erect addional buildings next fall. Equipment is complete so far as immediate needs are concerned. At present, and in the immediate future, the company will confine its manufacturing operations to heavy rotary in flat screens, sand screens, coal screens, cereal bolters, locomotive netting and spark arresters. These screens are manufactured under a new patent, which covers the manner of fastening wires or bars in an entirely new way.

The Jackson Visible Typewriter Co., has purchased a site at New Haven, Conn., from the New Haven Wheel Co. and will build a plant.

M. F. Smith, Parsons, Kas., manufacturer of the Smith double post drilling machines, will build an addition to his foundry next spring.

The new plant of the Lebanon Valley Iron Co., Lebanon, Pa., now being built, will have 8 double puddling furnaces and one 3 high puddling mill. One 7-inch finishing train and one 16-inch and 10-inch combination finishing

train. When the mill is in full operation it will have a capacity of about 80 tons of finished merchant bar iron in 24 hours.

F. M. Hawkins, general manager Satilla Manufacturing Co., Waycross, Ga., is interested in the organizatiin of the company which will erect car works in that city. Plans and estimates are for plant with capacity of ten cars per day, shops and buildings to cost about $72,000. Plans and estimates are ready for bids.

Williamson Bros. Co., Philadelphia, have obtained a permit to erect a foundry which will be a two and three-story structure, 329x146 feet, with an addition of 21x59 feet. The cost will be $60,000.

Ground has been broken for the plant of the Stewart Architectural Iron Works to be built at Covington, Ky., at an estimated cost of $25,000.

The people of Moline, Ill., are rejoicing over the removal of the last barrier to the erection of shops by the Rock Island Railroad in that city. This was a highway which the railroad company asked to have vacated. The action desired by the railroad company has been taken and extensive shops will be erected.

The new plant being built at Oregon, Ill. by Col. Frank O. Lowden and others, consists of a foundry 50x200 feet, and the machine shop 100x160 feet. The principal output of the foundry will be plates used in pianos.

The Snead & Co. Iron Works, Jersey City, N. J., will erect a three-story addition with a concrete base, iron columns and steel girders.

The C. A. Lawton Co. will break ground March 1st for a foundry 80x120 feet, which, it is expected, will be completed by May 15th. The present foundry of the company will be used as a pattern store room.

The Utica Pipe Foundry, Utica, N. Y., will erect a machine shop and warehouse 40x100 feet, three stories. The company is about to install machinery in an addition recently completed. The officers of the company are: President, Henry W. Millar; Vice President, I. A. Williams; Secretary and Treasurer, John A Kerman; Superintendent, John G. Gunn.

The new addition to the foundry of the Filer & Stowell Co., Milwaukee, which is now being erected, is 250x400 feet and will be used for the manufacture of gray iron and steel castings. It will cost about $400,000, and will double the capacity of the present plant.

I. J. Merrill, recently of Chicago, has purchased a cooper foundry and machine shop at Lewiston, Idaho. It is understood that the plant will be enlarged.

The Chicago Heights Foundry Co., Chicago Heights, Ill., will erect a plant which will cost $25,000. The principal building will be the foundry 100x150 feet, and there will be a machine shop 60x150 feet, boiler house, pattern shop and warerooms.

The Riverside Bridge Co., Wheeling, W. Va., is making additions to its plant which will enable it to turn out the heaviest kind of railroad bridge material, beginning about the 1st of April. The main shop is 150x300 feet, machine shop 80x50 feet, foundry 100x50 feet and forge department 80x40 feet.

The Pittsburg District:—

The Pittsburg Filter Mfg. Co., Empire Bldg., Pittsburg, speaks favorably of the outlook for business in water purification and filter plants, for the year 1903. This company has just completed the large filter plant for the Sharon, (Pa.), water works, of 2,000,000 gallons daily capacity and the Upper Sandusky, (O.), water works, 1,000,000 gallons. It has under construction at the present time equipment as follows: Cleveland Furnace Co., Cleveland, 600,000 gallons; Keokuk Cereal Co., Keokuk, Iowa, 720,000 gallons; Buffalo, Roch., & Pbg. Ry. Punxsutawney, Pa., 350,000 gallons; United States Zinc Co., Pueblo, Colo., 60,000 gallons; George's Creek Coal & Iron Co., Farmington, W. Va., 100,000 gallons; Ashland & Wooster Ry. Co., Ashland, O., 15,000 gallons; Camp Rubber Co., Ashland, O., 15,000 gallons; H. B. Camp Co., Akron, O., 20,000 gallons; American Agricultural Chemical Co., Bayway, N. J., 55,000 gallons; National Malleable Casting Co., Chicago, Ill., 100,000 gallons. The company's chemists have just completed reports on the water supply of several leading railroads, with a view of contracting with them for furnishing a complete supply of good boiler water.

The R. D. Nuttall Co., of Pittsburg, has received an order from a prominent automobile company for 12,000 gears. This is believed to be the largest individual order for gears ever placed.

The copper mills of C. G. Hussey & Co., Second Avenue, Pittsburg, were destroyed by fire this week, entailing a loss of about $50,000. The explosion of a gas producer caused the fire.

Announcement was made this week at the office of the Youngstown Car Mfg. Co., in the Frick Building that a department to manufacture pit cars, mine screens and mining supplies would be added to the company's plant at Youngstown, O., in order to provide additional work for the company's foundry which is too large to operate at its capacity on car castings.

Announcement was made last week by the American Bridge Co. that plans have been prepared for laying out a model town to be known as Ambridge on the hill overlooking the company's new plant on the Pittsburg, Ft. Wayne & Chicago railroad near Pittsburg. The town is to occupy a site of 120 acres and a large number of homes are to be built for the men to be employed in the plant. The plans provide for large park in the town and the improvements to be made by the American Bridge Co. will no doubt result in the development of an ideal industrial community.

A conference was held in Pittsburg last week between officials of the American Tin Plate Co. and the Amalgamated Association over the reported violation of clause 5 of the tin plate scale. This clause provides that all sheets or tin plates, 14 feet square and over, when finished in six or more sheets to the pack shall be paid at an advance of 10 percent above the tin plate scale on 26-gauge and heavier, and 20 percent for all lighter gauges up to and including 32-gauge, and for all sheets or tin plate 15½ square feet and over, finished in fours, the same percentage shall apply. The tin workers some time ago reported to headquarters that at some of the Western mills black plates were rolled which were not to be tinned at the regular tin plate rates and an investigation was made. The conference resulted but the Amalgamated officials could not prove that the clause was being violated and the conference adjourned without taking any formal action. However, tin plate workers have been instructed to report any future violations to their delegates who will attend the convention at Columbus on April 14, when the matter is to be acted upon.

The National Nut & Bolt Co., of Pittsburg, has been organized by those interested in the shovel plant of Hubbard & Co., of Pittsburg, and a Pennsylvania charter for the incorporation of the company has been applied for. The new concern will manufacture nuts, bolts, washers, etc. The plant will be located on a two acre site located on Butler Street.

The Hampton Coal & Coke Co., of Pittsburg, recently incorporated under the laws of the state of New Jersey, has purchased coal and coking property in Upshur County, W. Va., for a consideration of $375,000. The property will be opened up within about six months. A large number of coke ovens are to be built on the property.

The Standard Steel Car Co. has received orders during the past few days for cars aggregating in value over $2,000,000. The Union Pacific railroad has ordered 500 steel stock cars and 300 steel gondolas each with a capacity of 50 tons. The Oregon short line has ordered 300 all steel gondolas and 300 stock cars while the Great Northern has placed orders for 500 double hopper bottom steel coal cars.

Foundry No. 2, operated by Thomas Carlin Sons & Co., on River Ave., Allegheny, Pa., was completely destroyed by fire last week entailing a loss of $150,000. The

pattern shop adjoining the foundry was also destroyed as well as the office. The plant will be immediately rebuilt.

The Mesta Machine Co. has shipped the large reversing engine to operate the 44-inch blooming mill of the Tennessee Coal, Iron & Railroad Co. from its plant at West Homestead, Pa. The engine cylinders are each 55 inches in diameter and of 66-inch stroke. The crank shaft of the engine weighs about 60 tons.

The Carnegie Steel Co. has decided to erect its new 140-inch plate mill at Munhall, the site of the Homestead Steel Works. It will adjoin the 32-inch mill at that place.

General Industrial Notes.—

The Peden Iron & Steel Co., Houston, Texas, which recently increased its capital to $500,000, does not contemplate purchasing machinery for its own use, but will do a jobbing business in engines and boilers, sawmill machinery, heavy hardware, roofing materials, tinners' supplies, telephone supplies and mill supplies generally. The capital was increased to keep pace with the growth of the company's business.

Hon. Wm. E. Miller, who was recently appointed receiver of the Newark Iron & Steel Co., Newark, O., contemplates putting in some new machinery. The company has made steel castings which have given satisfaction and has a large number of orders on hand. Mr. Miller has been the manager of the Scheidler Machine Works, Newark, for 20 years, and has other important business connections.

The Columbus Chain Co., Columbus, O., has been reorganized with a capital of $400,000, half common and half preferred. The organization retains as its officers, C. M. Wambaugh, president and general manager, and Daniel Carroll remains as superintendent. Both have had long experience in the business. The company was incorporated three years ago, starting with 30 employes. It now employs 200 men. The increase of capital was made imperative by increased business.

J. T. Rowlands, inventor of the Simplex molding machine, is now having the machine made in Racine, Wis., instead of Milwaukee, where it was made until recently. Orders have been coming in freely and Mr. Rowlands expects to organize a stock company, but he advises us that reports that he expects to build a plant are premature.

The Coshocton Iron Co., Coshocton, O., will remove its plant from that town to Monongahela City, Pa., where it is building an up-to-date plant. Just how soon plans can be perfected to carry out this idea is, as yet, a little uncertain. In order not to interfere in any way with orders this company cannot leave Coshocton until the new plant is found to be in satisfactory running shape, probably April 1. It is the intention to manufacture a general line of mill castings, with a specialty of pipe balls, bell dies and axle boxes and in fact anything usually supplied by a first class foundry, as it will have a complete pattern and machine shop. The company solicits inquiries for cast iron pipe fittings.

The Wilmot Castle Co., Rochester, N. Y., recently incorporated, succeeds Wilmot Castle & Co., and will continue the manufacture of sheet metal specialties, one of which is the New Era radiator. The capital is $100,000, all subscribed.

The annual meeting of the Central Foundry Co., Ft. Wayne, Ind., resulted in the election of the following officers: President, William C. Walda; vice president, Frank Bercot; secretary and treasurer, H. F. Bullermann. The foundry will be enlarged, as enough orders have been received to keep the plant going for six months.

The Struther-Wells Co., Warren, Pa., has secured a contract for a penstock pipe 9 feet in diameter and about 450 feet in length for erection at Shawinigan Falls, Quebec. The pipe will be constructed of ⅜ and 7-16-inch steel.

The first metal bedstead made in the State of Washington was turned out a few days ago at the new plant of the Carman Mfg. Co., at Tacoma. The plant will turn out 100 bedsteads per day.

The Massey Iron Works, Kansas City, Mo., have been sold by Alexander Massey and the Baum Iron Works, of Omaha, the owners of the plant, to C. E. Faeth, of Sioux City, Iowa, and the Nichols, Dean & Gregg Iron Co., of St. Paul. Mr. Massey and his associates have retired and the new owners are in possession. The capital stock of the company will be increased from $100,00 to $200,000. The works will be enlarged.

A receiver has been appointed for the Burton Handle Co., Chardon, O., on application by the Cleveland Hardware Co.

Barry & Zecher, Lancaster, Pa., advise us that the pattern making business formerly conducted by their Mr. Zecher at 135 Christian St., has been combined with their foundry business on North Plum St., and that they are now in position to furnish wood and metal patterns, also iron castings up to 4,000 pounds weight.

The Kirby Lumber Co., of Houston, Texas, has purchased the Southern Car Mfg. Co.'s foundry and machine shop, at Beaumont, Texas, and will continue same as Kay Ell Foundry & Machine Works. This plant will be operated for manufacturing and repairing for sawmills, tramroads, and other timber development properties.

The plant of the American Sheet Steel Co., at Muncie, Ind., has resumed after being idle almost two months.

The D. Clint Prescott Co., Menominee, Mich., has made improvements to its plant which double its capacity.

The Sterling Machine Co., Sterling, Ill., is now running its plant night and day.

Manufacturing plants of Syracuse, N. Y., are as a rule running to their full capacity in order to meet demands. The Alexander Iron Works and the Stearns Hardware Co. have been doing night work. The Syracuse Chilled Plow Works are enjoying a large export trade. The plant of the plow works has been operated until 10 o'clock at night of late.

The new plant of the United States Pump & Supply Co., Toledo, O., will soon be finished. The main building is 80x200 feet with a wing of 30x40 feet. Another addition 40x200 feet is contemplated.

A riveting gang at the Toledo plant of the American Bridge Co. recently drove 7,728 rivets in 10 hours, the rivets being ⅞ inch in diameter and driven on channel span work. The greatest number of rivets driven before this is said to have been at Medina, Pa., when 6,508 were driven in 10 hours.

The Colorado Fuel & Iron Co. is shipping a heavy tonnage of light railroad rails to the mines of Arizona, using Tucson as the shipping point.

The Frank F. Porter Co., Chicago, recently incorporated, succeeds Frank F. Porter. The object of the incorporation is to interest the faithful employes, by which means Mr. Porter hopes to increase the business in volume, as well as in the percentage of profits, by having employes personally interested. It is not the intention to change in any way the management of the business, neither to put any stock on the market, outside such employes. The new business will be conducted on the same general lines as before, namely, the handling of shelf and builders' hardware, including heavy hardware, cutlery, sheet metal work and the manufacture of the Porter hot air furnace, for jobbing and the retail trade.

The four idle mills of the tin plate plant of the Sharon Steel Co. at Sharon, Pa., were placed in operation this week. The plant is now operating in full for the first time in almost eight months. The other sixteen mills of the plant were placed in operation two months ago.

The Banner Electric Co., Youngstown, O., has decided to make extensive improvements and the size of the plant is also to be considerably enlarged. Machinery for the manufacture of switches, automatic time clocks and other electrical devices will be installed.

The Eames Pulley Co., Battle Creek, Mich., at a recent meeting, decided to increase its capital from $30,000 to $50,000. D. L. Merrill was elected president, G. T. Eames, vice president and general manager, J. P. Hely, secretary and W. L. Dunbar, of Jackson, Mich., treasurer.

The newly overhauled furnace of the Georgia Iron and Coal Co. at Rising Fawn, Ga., is now making iron for the first time in seven years. It has been made modern in every way, and fitted for an output of 200 tons a day.

The blast furnace of The Georgia Iron & Coal Co., at Rising Fawn, Ga., was blown in on Feb. 14. Its daily capacity is 100 tons.